

PRINCIPLES OF INVESTMENT

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SECOND EDITION
THIRD IMPRESSION

McGRAW-HILL BOOK COMPANY, Inc.

NEW YORK AND LONDON

1933

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THE MAPLE PRESS COMPANY, YORK, PA.

TO
MY MOTHER AND FATHER

PREFACE

The original edition of "Principles of Investment" has been almost entirely rewritten and the work now appears as the second edition. It was felt that a rewriting was necessary primarily on account of the changes in economic and political conditions and institutions occasioned largely by the World War. Many of the changes doubtless will prove permanent so that it has become necessary to reexamine fundamental forces and laws that control investments. Among the changes that have vitally affected the investment of capital may be mentioned the altered status of production, international trade, finance, and the new distribution of gold; to these must be added changes in political relations, taxation, and tariffs; important also are the Federal Reserve System and the new status of labor. These and other events have largely changed the setting of the financial stage. Moreover, certain theoretical laws, which are sound at the core, nevertheless need restatement to suit the new situation.

For the most part the present edition retains the general conception and organization of the original work. But even here some changes have been made partly to facilitate treatment and partly to give greater emphasis to certain aspects of the subject. It has been thought best to approach the subject matter through the analysis of the fundamental concept of income. Economically conceived, investment is the science of procuring income from capital. Investment income itself is the measure of the usefulness of service of capital to society. The amount of income depends upon the scarcity of capital and the risk involved in capital commitments. It appears, therefore, that treatment of the subject of investment would revolve around the pivotal points of income, risk, and the money and capital markets. These concepts seem to embrace the fundamental concepts of the subject.

The present edition, like the first edition, has been divided into five parts. However, the essential material of Part V of the original edition has been absorbed in other parts of this edition. This step was decided upon partly to facilitate treatment and partly to economize space. The latter became imperative on account of the expansion of material in other parts of the work. Part III of the original edition has been divided into two parts, the one dealing with private securities, and the other with public obligations.

Part II dealing with the Elements of Investment Credit has undergone a change in the order of treatment. Starting from the fundamental concept of income in Part I, it seems logical to give this precedence of

treatment in Part II. The treatment of income is naturally followed by treatment of assets, the other economic element in credit. Given the economic foundation of investment credit, further interest centers in the legal rights and duties of the holders of the various classes of securities and the provisions which safeguard their position. But the tardy development of the law has left a large measure of discretion to those in control of industry, while both economics and law fail to take adequate account of the human element in finance. Treatment of this matter follows and completes the analysis of the subject of investment credit.

Part III, like Part II, has undergone a change in the order of treatment. It was found that the general importance of income in investment and its special significance as an element of credit naturally lead to analysis of corporate and other private investments first. These in turn form a valuable economic background for the treatment of public obligations, which follows in Part IV.

The treatment of railroads and public utilities has been enlarged. Separate chapters have been written on the Economics of Railroad Transportation, Railroad Regulation, Financial Analysis of Railroads, and Railroad Securities; in the field of public utilities independent treatment has been given to each utility so that separate chapters now appear on Regulation of Public Utilities, Electric Light and Power, Gas Industry, Water Works, Electric Railways, the Telegraph, and the Telephone. In addition to these, new chapters have been included on Bank Stocks, Insurance Stocks, and Investment Trusts. Part V (formerly Part IV) has been reorganized into four chapters on Fundamental Causes of Price Movements, Business Fluctuations, Bond Prices, and Stock Prices.

A word should be said in regard to the mechanical changes in the new edition. Numerous sectional headings replace the infrequent captions of the original edition. This mechanical device renders a grasp of the subject matter easy for the reader and greatly facilitates the use of the work for reference purposes.

The author wishes to express his feeling of obligation to all who in one way or another have had a part in shaping this work. This obligation extends to former teachers and associates who by their scholarship and friendly criticism lent inspiration to the work of research and the general pursuit of knowledge. He wishes to acknowledge special obligation to his many colleagues in the teaching and scientific professions for their valuable oral and written contributions. Lastly should not be forgotten the suggestions of those in the practical world of finance and investment whose interest in the literature of the subject never lags.

J. E. KIRSHMAN.

LINCOLN, NEBRASKA,
November, 1932.

CONTENTS

PREFACE	PAGE vii
-------------------	-------------

PART I THE ECONOMIC BASIS OF INVESTMENT

CHAPTER I

INVESTMENT DEFINED.	3
The origin of investment, 3. Modern investment, 4. The economic reserve, 5. Consumers' goods as capital, 6. Usage of the term investment, 6. Individual investment, 7. Scope of investment, 8. Motives in investment, 8. Investment for income, 9. Profits, 11. Speculation distinguished from investment, 12. Speculative investors, 14. Risk and risk-bearers, 14. Gambling distinguished from speculation, 15. Common ground, 18. Investment and finance, 18.	

CHAPTER II

MODERN INVESTMENT.	20
Intangible character of modern investment, 20. The evolution of modern investment, 21. The joint-stock company, 22. Corporations in the United States, 24. Features of the corporation, 25. Separation of ownership and management, 26. Risk and income, 27. Weakness of corporate form of organization, 28. Public debts, 28. The period 1820-1860, 29. The Civil War period, 30. The period 1865-1900, 30. The period 1900-1914, 30. Recent American finance, 31. Investment banking, 32. Evolution of investment banking, 32. Rise of the bond house, 33. International banking houses, 34. Evolution of exchanges, 35. The New York Stock Exchange, 37. Listings, 39. Other exchanges, 39. Economic functions of the stock exchange, 40.	

CHAPTER III

THE SUPPLY OF INVESTMENT FUNDS	42
Law of diminishing returns, 42. Supply and demand, 42. Development of capital in the United States, 43. Recent accumulation of capital, 44. Total capital accumulation, 46. National income and savings, 46. Business savings, 49. Commercial banks, 49. Savings banks, 51. Insurance companies, 51. Building and loan associations, 52. Farm loan system, 52. Political stability and savings, 52. Sound currency, 52. International stability, 54. Economic factors, 54. Motives in saving, 55. The interest rate, profits, and saving, 58.	

CHAPTER IV

THE DEMAND FOR INVESTMENT FUNDS	61
Sources of demand, 61. Evolution of demand, 62. Statistics of capital accumulation, 63. Intangible wealth, 64. Annual demand for capital, 65. Federal debt, 65. State and municipal indebtedness, 67. Foreign investment, 68. Consumption demand for capital, 68. Speculative	

demand, 70. Funding operations, 71. Theory of consumption demand for capital, 71. Function of capital, 72. Ultimate demand for capital, 73. Capital and wages, 74. The law of proportional costs, 74. Demand and reward, 75. The division of risk, 75. Trading on the equity, 75. Investors versus managers, 76.

CHAPTER V

THE RETURN TO INVESTED CAPITAL	77
Financial results of business, 77. Income according to size, 78. Earlier experience, 81. Recent comparative results, 83. Business failures, 84. Low level of profits, 84. Inventions and discoveries, 85. Effect of good management, 86. Lack of uniformity of results, 86. Immobility of capital, 87. Fixed capital, 87. Liquid capital, 87. Competition, 88. Monopoly, 89. Changes in the price level, 89. Dynamic character of industry, 90. Risk and profits, 90.	

CHAPTER VI

INTEREST AND PROFITS	92
Gross and net return, 93. Marketability, 93. Interest, 94. Gross and net interest, 95. Pure interest and risk-interest, 95. Theories of interest, 96. Productivity theory, 96. Exchange theory, 96. The equilibrium theory, 97. Supply and demand, 97. Interest the price of capital funds, 98. Current demand and supply alone effective, 98. The supply of money and the interest rate, 101. Market rates of interest, 102. Bond yields, 103. Theories of profit, 104. Elements in profits, 105. Investment significance of interest and profit, 106. Speculative profits, 107.	

CHAPTER VII

VALUE, PRICE AND YIELD.	108
Present value of future income, 108. Irregular income, 109. The risk factor, 109. Taxation, 110. The case of stocks, 110. The common measure of value, 111. Nominal return, 111. Bond yields, 113. Interpolation, 115. Interest interval, 115. Interest rate on the amortization fund, 115. Market quotations, 116.	

PART II

THE ELEMENTS OF INVESTMENT CREDIT

CHAPTER VIII

THE INVESTMENT RISK	121
Indefiniteness of the term "safety," 121. Commodity prices and the investment risk, 123. Time element and risk, 124. Principal and income, 126. The credit risk, 128. Financial risk, 129. The market risk, 130. Unpredictable risks, 131. The safe investment, 133. The elements of investment credit, 134.	

CHAPTER IX

INCOME ELEMENT OF CREDIT	136
Income versus assets, 136. Consumption loans, 137. Government loans, 138. Income as a basis of credit, 139. Income requirements, 140. Stability, 140. Permanence, 140. Quality, 141. Income analysis, 141. Income	

	PAGE
statement, 142. Gross operating income, 143. Price changes, 143. Volume, 144. Direct expenses, 144. Gross profits, 145. Net profits, 146. Other income, 147. Total income, 147. Deductions, 148. Net income, 148. Sinking funds, 148. Holding companies, 149. Income ratios, 150. Operating ratio, 150. Net income to investment, 151. The margin of safety, 152. The factor of safety, 152. Future income, 156.	

CHAPTER X

THE ASSET ELEMENT OF CREDIT.	158
Importance of assets underestimated, 158. Importance of earnings overestimated, 159. Nature of assets as security, 160. Assets in liquidation, 161. Asset values, 161. Value and price, 162. Specialized and non-specialized assets, 164. Luxuries and necessities, 164. Price changes in the business cycle, 165. Fixed assets, 166. Wasting assets, 167. Current assets, 168. Cash, 168. Inventory, 169. Current assets as a basis of credit, 171. Investments, 171. Intangible assets, 172. Margin of safety, 173. Financial ratios, 175. Current ratio, 175. Cash to current obligations, 176. Assets to capitalization, 176.	

CHAPTER XI

CONTRACTUAL ELEMENT OF CREDIT: BONDS AND NOTES	178
Evolution of the contract, 178. Nature of investment contracts, 180. Bonds versus stocks, 180. Risk, income, and control, 181. Fixed income, 181. Contingent income, 182. Participating income, 183. Dividends on common stock, 183. Control, 184. Apportioning the risk, 184. Corporation mortgages, 185. The trustee, 186. Tax covenant, 187. Registered versus coupon bonds, 188. Default, 188. Open and closed mortgages, 189. Blanket and specific mortgages, 190. Junior mortgages, 190. Reorganization, 191. Collateral trust bonds, 192. Equipment obligations, 193. Debenture bonds, 194. Assumed bonds, 195. Guaranteed bonds, 195. Joint bonds, 196. Receivers' certificates, 196. Sinking funds, 197. Serial issues, 199.	

CHAPTER XII

THE CONTRACTUAL ELEMENT OF CREDIT: STOCKS	201
The board of directors, 201. Duties of directors, 202. Stockholders' participation in management, 202. Voting rights, 203. Powers of stockholders, 204. Rights of stockholders, 205. Right to inspect the books, 206. Liability of stockholders, 206. Liability to creditors, 207. Personal liability of stockholders, 207. Watered stock, 208. No-par stock, 209. Increase or reduction of capital stock, 210. Lost certificates, 210. Rights and warrants, 210. Valuation of rights, 211. Preferred versus common stocks, 211. Classified preferred stock, 212. Cumulative versus non-cumulative dividends, 213. Preference as to assets, 214. Protective features, 215. Future liens, 216. Asset provisions, 217. Earnings provisions, 218. An example, 218. Class A common stock, 219. Position in reorganization, 220.	

CHAPTER XIII

MANAGEMENT ELEMENT OF CREDIT.	222
Personal element in credit, 222. Specialization of management, 223. The investment banker, 223. Two aspects of management, 224. Importance	

of management, 224. Devotion to task, 226. Maintenance of property, 226. Relation to labor and personnel, 227. Progressive management, 227. Good faith, 228. Changing attitude, 228. Recognition of good faith as an element in credit, 229. Character of basic importance, 230. Keeping the contract, 231. Accounting methods, 232. Overcapitalization, 233. Dividend policy, 234. Manipulation, 236. Pyramiding, 237. Other evils, 237. Publicity, 237. Caveat emptor, 239. Management as trustee, 239.

CHAPTER XIV

THE RATING OF SECURITIES.	242
Bases for rating securities, 242. Moody's rating system, 244. Symbols, 248. Stocks, 248. Estimate of system, 249. Poor's rating service, 250. The Fitch rating service, 252. Rating for safety, 253. Importance of the future, 255.	

PART III

THE FIELD OF INVESTMENT: PRIVATE SECURITIES

CHAPTER XV

ECONOMICS OF RAILROAD TRANSPORTATION	259
Primitive transport, 259. Old world transport, 259. Modern transport, 260. Early transportation in America, 260. The turnpike, 262. The steamboat, 263. The canal, 264. Early railroads in England, 265. The railroad in America, 266. Railroads versus canals, 268. Gridironing the country, 268. Railroad equipment, 270. Rates, 270. Consolidations, 271. Railroads and progress, 272. Present status, 272. Automotive competition, 273. Waterways, 274. Other forms of rail competition, 275. Present trend in railroad traffic, 275.	

CHAPTER XVI

RAILROAD REGULATION	277
The power of regulation, 277. Early antecedents, 277. Mediaeval regulation, 278. Common law basis of control, 278. Mercantilism, 279. Laissez faire, 279. Regulation in America, 280. Charter restrictions, 281. Early statutes, 281. The background of regulation, 282. Regulation by competition, 283. Granger laws, 283. The constitutional power to regulate, 284. Federal versus state authority, 285. Interstate Commerce Act of 1887, 286. Judicial review, 288. The Elkins Act of 1903, 288. The Hepburn Act of 1906, 288. The Mann-Elkins Act of 1910, 291. The Panama Canal Act of 1912, 292. The Clayton Act of 1914, 292. Reasonable rates, 293. The Valuation Act of 1913, 294. Depreciation in railroads, 296. Final values, 297. Transportation Act of 1920, 297. Consolidation, 300. Other methods of combination, 300. Eastern trunk lines, 301. Labor problems, 301. Railway Labor Act of 1926, 302. Securities, 302. The Hoch-Smith resolution, 303. The O'Fallon Decision, 304. Results of the O'Fallon Decision, 305. Rate of return, 305. Railroad credit, 306.	

CHAPTER XVII

FINANCIAL ANALYSIS OF RAILROADS	309
Traffic, 309. Passenger traffic, 311. Traffic origin, 311. Permanence of traffic, 311. Average haul, 312. Traffic density, 312. Plant situation,	

313. Extra track, 314. Grades and curves, 314. Equipment, 315. Operating efficiency, 315. Freight-car performance, 315. Locomotive performance, 316. Freight-train performance, 316. Fuel consumption, 316. Equipment utilization, 317. Employment, 317. Income, 317. Operating revenues, 317. Non-operating revenues, 318. Seasonal variations, 319. Cyclical fluctuations, 319. Operating expenses, 320. Operating ratio, 322. Taxes, 323. Net railway operating income, 323. Railway property as security, 323. New capital investments, 324.

CHAPTER XVIII

RAILROAD SECURITIES. 326

Financial history, 326. The construction company, 327. Effects of over-capitalization, 328. Overissue of bonds, 329. Stock dividends, 331. The Panic of 1893, 331. Consolidations, 331. Recent financing, 333. Bonds versus stocks, 333. Present capitalization, 333. Causes of failure, 335. Margin of safety, 336. Mortgage bonds, 336. Blanket-mortgage bonds, 337. Debenture bonds, 338. Notes, 338. Assumed bonds, 338. Guaranteed bonds, 338. Income bonds, 339. Convertible bonds, 339. Collateral trust bonds, 339. Equipment obligations, 340. Preferred stock, 341. Common stock, 341. Market for railroad securities, 343.

CHAPTER XIX

REGULATION OF PUBLIC UTILITIES 345

Meaning of term, 345. Legal classification, 345. Stages in regulation, 346. Local regulation, 348. Franchises, 349. Regulation by franchise, 350. Commission regulation, 351. The indeterminate permit, 351. Certificates of public convenience, 352. Advantages of commission system, 352. Legal status of the commission, 353. Home rule, 353. Sliding-scale franchises, 354. Service-at-cost franchise, 355. The Milwaukee agreement, 356. The dilemma of regulation, 357. The legal doctrine of valuation, 357. Appraisal of property, 358. Valuation standards, 358. Competitive cost the true principle, 360. Land valuation, 361. Working capital, 362. Valuation and accrued depreciation, 362. Theory of accrued depreciation, 363. Depreciation a cost of service, 364. Retirement reserve, 365. Basis of computing depreciation, 366. Summary of Supreme Court's position, 367. Rate of return, 368. Recent trends, 369. Actual cost of capital and rate of return, 371.

CHAPTER XX

ELECTRIC LIGHT AND POWER. 375

The realm of electricity, 375. Technical development, 376. The electric light, 376. Electric power, 378. Edison stations, 379. The growth of the electrical industry, 380. Hydro-electric power, 381. Economics of hydro-electric development, 382. The function of the hydro-electric plant, 383. Future of water power, 384. Outlook for the light and power industry, 384. Rural electrification, 385. The farm load, 386. Farm rates, 386. Electrification of railroads, 387. New uses for electricity, 388. Interconnection, 388. Operating revenues, 389. Operating expenses, 391. Taxes, 392. Operating ratio, 392. Effect of the business cycle, 392. Assets, 394. Corporate organization, 394. The holding company, 396. The management company, 396. The investment company, 396. Capitalization, 397. Mortgage bonds, 398. First and refunding mortgage, 398. Debenture

bonds and notes, 399. Preferred stocks, 399. Common stocks, 400.	PAGE
Market for electric securities, 400.	

CHAPTER XXI

GAS INDUSTRY	403
Early beginnings of gas industry, 403. Gas industry in the United States, 404. Technical improvements, 406. Gas by-products, 407. Manufactured gas, 407. Recent progress, 408. Natural gas in the United States, 409. Utilization of natural gas, 409. Development of natural gas, 410. Problems created by natural gas, 412. Domestic use of gas, 412. Gas in industry, 414. Gas research, 415. Gross operating revenues, 415. Operating expenses, 416. Taxes, 416. Operating ratio, 417. Net income, 417. Assets of gas companies, 417. Capitalization of gas industry, 418. Bonds, 418. Preferred stock, 420. Common stocks, 420. Holding company securities, 420.	

CHAPTER XXII

WATER WORKS.	423
Early history, 423. Middle Ages, 424. Modern water works in Europe, 424. Water works in the United States, 425. Technical improvements, 426. Watery supply, 426. Location of supply, 427. Ownership of water systems, 429. Municipal bonds for water works, 429. Main uses of public water supply, 430. Taxation of water works, 430. Gross revenues, 431. Operating expenses, 431. Depreciation, 432. Operating ratio, 433. Net annual revenue, 433. Assets, 434. Corporate organization, 435. Capitalization, 435. Bonds, 436. Holding company securities, 436. Preferred stock, 437. Common stock, 438.	

CHAPTER XXIII

ELECTRIC RAILWAYS	438
Early street railways, 438. Early electric railways, 438. Modern development, 440. The war and after, 441. Causes of receivership, 443. Fares, 443. Automotive competition, 444. Other difficulties, 446. Street railway franchises, 447. Recent progress, 447. Traffic density, 448. Accounting, 449. Operating revenues, 449. Operating expenses, 449. Taxes, 450. Operating ratio, 450. Operating income, 451. Seasonal fluctuations, 451. Cyclical fluctuations, 451. Electric railway finances, 452. Electric railway securities in receivership, 453. Capitalization, 453. Electric railway bonds, 454. Notes, 454.	

CHAPTER XXIV

THE TELEGRAPH	456
Communication by signal, 456. The electric telegraph, 456. Morse's telegraph, 458. Commercial development, 459. Pre-war stagnation, 461. The war and after, 462. Improvements, 463. Technical advances, 463. Repeaters, 464. Simple system, 464. Other improvements, 464. The ocean cable, 465. Western Union cable service, 467. International Telephone and Telegraph Company, 468. Wireless telegraphy, 469. Revenues, 470. Operating expenses, 470. Operating ratio, 471. Net income, 471. Cyclical fluctuations, 471. Seasonal variations, 471. Capitalization, 471. Bonds, 472. Stock, 472.	

CHAPTER XXV

THE TELEPHONE	474
Early experiments, 474. The exchange, 475. Period of monopoly, 478. Western Electric Company, 478. American Telephone and Telegraph Company organized, 479. Financing, 480. Period of competition, 480. The American Telephone and Telegraph Company assumes responsibility, 480. Recent progress, 483. The telephone naturally a monopoly, 483. Technical progress, 483. Long-distance telephony, 484. Extension of service, 484. Outlook, 485. Regulation, 485. State commissions, 486. Accounts, 486. World position of United States, 487. Gross revenues, 488. Cyclical influences, 489. Operating expenses, 490. Depreciation charges, 490. Operating ratio, 490. Net income, 490. Assets, 491. Capitalization, 491. Bond issues, 492. Debentures, 492. Mortgage bonds, 492. Preferred stock, 493. Common stock, 493.	

CHAPTER XXVI

INDUSTRIAL SECURITIES	496
Rise of industrial securities, 496. Industrial competition, 497. Industrial receivership, 498. Substitution of product, 498. Obsolescence of product, 499. Classification of industrial corporations, 499. Manufacturing concerns, 501. Industries serving consumers, 502. Industries serving both producers and consumers, 503. Trading companies, 504. Income, 504. Importance of trend, 505. Margin of profit, 506. Earnings on invested capital, 507. Influence of the business cycle, 508. Depreciation policy, 508. Assets of industrial concerns, 511. Current ratio, 511. Inventory, 512. Accounts receivable, 513. Cash, 513. Current liabilities, 513. Capitalization, 514. Industrial bonds, 514. Record of industrial bonds, 516. Preferred stocks, 517. Common stocks, 519. Market for industrial securities, 520.	

CHAPTER XXVII

BANK STOCKS	522
Early banking, 522. Mediaeval banking, 523. Modern banking, 524. Banking in the United States, 525. Bank failures, 527. Causes of failures, 527. Management, 529. Supervision, 531. Consolidation of banks, 532. Branch banking in the United States, 532. Bank revenues, 533. Expenses, 534. Reserves, 534. Net earnings, 535. Efficiency of bank operations, 535. Bank assets, 535. Bank liabilities, 536. Bank stock, 537. Financial results, 538. Ownership of bank stock, 539.	

CHAPTER XXVIII

INSURANCE STOCKS	541
Marine insurance, 541. Marine insurance in the United States, 542. Fire insurance, 543. Fire insurance in the United States, 544. Recent experience, 546. Life insurance, 547. Life insurance in the United States, 548. Present status of life insurance, 549. Surety and fidelity insurance, 550. Credit insurance, 550. Automobile insurance, 550. Finances of insurance companies, 550. Loading for expenses and taxes, 551. Underwriting profit and loss, 552. Investment operations, 553. Assets, 555.	

CHAPTER XXIX

INVESTMENT TRUSTS	559
Early investment trusts, 559. English experience, 559. American invest-	

ment trusts, 561. Types of trusts, 561. Management trusts, 561. Investment fund trusts, 562. Fixed trusts, 562. The finance company, 563. Experience of the trusts, 563. Accounting methods, 563. Abuses of trusts, 564. Financial policy, 564. Common stocks as investments, 566. Diversification, 567. Capitalization, 568. Stocks, 569. Prices of investment trust securities, 569. Market for trust stocks, 570.

CHAPTER XXX

REAL-ESTATE SECURITIES 571

Antiquity, 571. Site values, 571. Principles of valuation, 572. Valuation systems, 574. Sale prices, 575. Growth of values, 576. Income as an element of credit, 577. Rentals, 578. Residence property, 579. Unoccupied property, 580. The mortgage, 580. Transfers, 582. Default and foreclosure, 583. Second mortgages, 584. The mortgage bond, 585. The guaranteed mortgage, 585. The collateral bond, 585. Land trust certificates, 585. Stock and bond issues, 586. Recent experience, 586. Market for real-estate securities, 586.

CHAPTER XXXI

FARM MORTGAGES 588

Development of farm mortgage business, 588. Income from farm property, 589. Location and accessibility, 590. Management, 591. Prices of farm products, 591. Farm accounting, 592. The value of farm property, 594. Federal Farm Loan System, 597. Federal Land Banks, 598. Federal Land Bank bonds, 599. Joint Stock Land Banks, 600. Joint Stock Land Bank bonds, 600. Joint Stock Land Bank stocks, 601. Farm-mortgage indebtedness, 602. Experience in Nebraska, 603. Taxation, 603. Causes of agricultural depression, 604. Market for farm mortgages, 604.

PART IV

THE FIELD OF INVESTMENT: PUBLIC OBLIGATIONS

CHAPTER XXXII

UNITED STATES GOVERNMENT BONDS. 609

Early record of the United States, 609. The second period, 611. The Civil War and after, 612. The World War, 614. The moratorium, 614. Retirement provisions, 614. Present outstanding bonds, 616. The government contract, 619. Payable in gold, 619. The burden of a national debt, 620. The wealth of the United States, 621. National income, 622. Revenue system, 623. Federal expenditures, 625. Market price and yield, 626.

CHAPTER XXXIII

AMERICAN STATE BONDS. 629

Revolutionary debts, 629. Public improvements, 630. The first period of default 1840-1842, 632. The period 1843-1860, 634. The Civil War and after, 634. The period 1914-1932, 638. The wealth of the states, 639. State revenue, 640. State expenditures, 641. Contractual features, 642. State sovereignty, 643. Restrictions on state debts, 644. Sinking funds, 645. Serial issues, 645. Floating debts, 646. Certification, 646. Taxation, 647.

CHAPTER XXXIV

MUNICIPAL BONDS	649
History of municipal debts, 649. Present status of local debts, 650. Causes of increase, 651. Defaults, 652. Recent defaults, 653. The burden of municipal debts, 654. Powers of municipal corporations, 655. Power of taxation, 656. Borrowing power, 657. Legality, 659. Debt limitations, 660. Invalidity, 661. Validation, 662. Warrants, 663. Bonds, 663. Special assessment bonds, 663. Remedy in default, 664. Sinking funds, 664. Serial issues, 665. Irrigation bonds, 666. Drainage, levee, and river-bank protection bonds, 669. Municipal bond prices, 671.	

CHAPTER XXXV

FOREIGN INVESTMENTS	672
America a creditor nation, 672. Purposes of issues, 675. Defaulted bonds, 676. Burden of national debts, 677. National budgets, 679. The balance of payments and the exchanges, 680. The breakdown of international credit, 681. Contractual features, 682. Sinking funds, 683. Pledged revenues, 683. Market, 684. Price and yield, 684.	

PART V
SECURITY PRICE MOVEMENTS

CHAPTER XXXVI

FUNDAMENTAL CAUSES OF PRICE MOVEMENTS.	689
The law of supply and demand, 689. Changes in supply of securities, 690. National income and savings, 692. Bank credit, 693. The bank rate of interest and bond prices, 695. Gold and credit, 695. The Federal Reserve Banks and credit, 697. Commodity prices and interest rates, 698. Bond prices and commodity prices, 701.	

CHAPTER XXXVII

BUSINESS FLUCTUATIONS.	703
Value versus price, 703. Dynamic economic forces, 703. Types of business fluctuations, 704. Secular movements, 704. Seasonal variations, 705. Business cycles, 706. Historical cycles, 706. Business-cycle theories, 707. Contribution of theories, 710. Statistics and business cycles, 710. Profits and business, 711. Economic equilibrium, 711. Price changes, 711. Changes in capital values, 712. Causes of commodity-price changes, 712. Price margins, 712. Demand and supply, 713. Speculation, 713. The time element, 713. The influence of banking, 714. Volume of business, 714. Agriculture and business, 714. Wages and business, 715. International business cycles, 716. Duration of cycles, 717. Prosperity and depression, 717. Cyclical amplitudes, 718. Business forecasting, 719. Business-cycle experience, 719.	

CHAPTER XXXVIII

BOND PRICES.	722
Historical interest rates, 722. Bond price movements, 723. Secular movements, 723. Bond prices from 1875 to 1899, 724. United States bond prices, 725. Changes in the investment market, 726. Bond prices from 1899 to 1920, 727. Bond prices since 1920, 729. Major cycles in bond prices, 730. Forecasting bond prices, 731. The war period, 732. Bond cycles since 1920, 732. The cataclysm of 1931, 731.	

CHAPTER XXXIX

STOCK PRICES	734
Value and price, 735. Stock Values, 735. Fluctuations in the interest rate, 736. Earnings versus dividends, 736. Relation of price to current earnings, 737. Discounting process, 738. Market factors, 738. Price-earnings ratio, 739. Stock price cycles, 740. Major cycles in stock prices, 740. Phases of major cycles, 741. Great cycles in stock prices, 741. Trends, 742. Fundamental factors in trends, 743. Forecasting stock prices, 744. Bond prices and stock prices, 745. Dow's theory, 746. Stock price averages, 748. The ratio chart, 748. Performance of individual stocks, 748. International stock prices, 749. Minor cycles, 749. Speculation and stock prices, 752. Short selling and stock prices, 754.	
GENERAL REFERENCES	759
INDEX	761

PART I
THE ECONOMIC BASIS OF INVESTMENT

CHAPTER I

INVESTMENT DEFINED

The subject of investment has reached an advanced stage of development and may be approached in the scientific spirit. If by science is meant accurate and systematic knowledge of facts, laws, and causes, then the inclusion of investment in the category of the sciences has ample justification. Nevertheless, investment is one of the newest of the departments of knowledge within the general field of economics. It abstracts from the general body of economic laws certain fundamental principles relating to the accumulation and employment of capital and its share in the distribution of the earnings of industry. These fundamental laws constitute the background of our subject, while the development of allied principles and their application to the various fields of investment give content to the work. The latter is specially concerned with the establishment of a body of technique the end of which is to gauge the effectiveness of the employment of capital in the various fields of enterprise. This can be accomplished only through the development of a definite body of principles grounded in fundamental economic laws but conditioned upon certain legal and moral safeguards. Fact and principle are thus blended into a homogeneous body of specialized economic knowledge which constitutes the science of investment.

The Origin of Investment.—If one is to comprehend the full significance of the term "investment," one must start with the idea of a surplus or fund of the means of subsistence. One must also think of this as a social fund or surplus arising through social causes. One may think of a primitive situation where the community has through sheer luck or perhaps conscious exertion come into possession of provisions greater in amount than is necessary to sustain daily life. This community then has the choice of living in idleness until the surplus is exhausted or utilizing its time in the fashioning of implements or contraptions calculated to ease the burden of life or better its existence through greater fruitfulness of its efforts in the future. If the latter alternative is chosen, spare time is employed in the creation of rude forms of capital which, however crude in appearance, will render incalculable assistance in future gainful efforts. But mark well that as these new implements are being made the surplus of the preceding period is utilized so that man soon finds himself without further means of support. Nevertheless he has made distinct advancement in that he now possesses tools that will multiply

the results of his efforts as he again turns to the pursuit of gaining a livelihood. He now is in possession of a capital fund. He has made an investment. In this three distinct processes are observable, namely, (a) the production of a surplus, (b) the saving of the surplus, and (c) the investment of that surplus.

Modern Investment.—This simple illustration drawn from primitive life describes processes which are essentially the same as those observed in civilized communities. The most obvious fact of economic life today is the accumulation of a vast fund of goods, which, although individually owned in our system of private property, is nevertheless cooperatively produced and accumulated through years of social effort. This fund of goods is composed partly of consumers' goods and partly of producers' goods. The former constitute the fund of subsistence which sustains the people while they are engaged in the production of more goods of like kind and also of additional capital which is to replace that now deteriorating through use as well as adding to the accumulated fund. In this way society is continually replacing its worn-out equipment and providing additional facilities for future needs. Civilized society thus lives off of the accumulated stock of consumption goods which itself is constantly being replenished and augmented by the stream of current production. This exchange of consumption goods for production goods is the fundamental process of investment.

Back of all the incidents of private property and ownership of wealth, back of the economic distribution of current income, back of the screen of money and credit that obscures from our vision fundamental economic processes, lie the three predominant operations of producing, saving, and investing. One may here envisage the most complicated, the most delicate, and at the same time the most wonderful mechanism in the greatest cooperative enterprise in which the human race has ever engaged. One can easily become inspired with the theme and picture the myriads of human beings under all suns and in all climates quietly pursuing their occupations, each contributing an infinitesimal part to the grand objective of all, namely, the creation of something of use to the human race. In this great *ensemble* of effort are the countless specialized farms, factories, and work shops in every land, the varied means of transportation ranging from the sled and canoe to steam railroads and leviathans of the high seas, while countless persons are directing and redirecting, distributing, packing, and sending goods to their destination. Nor should one forget the miners of precious metals and the dealers in money and credit without whose efforts the entire process could not eventuate. Wherever equipment is found which assists in the production of want-satisfying goods and services, in speeding them on the way to the consumer, or in facilitating the process in general, there will be found capital, there an investment has been made in the economic meaning of the term. In more

prosaic language and from the standpoint of pure economics, investment may be defined simply as the application of current surplus funds in the creation of capital goods for the sake of future gain in the amount and quality of goods for consumption

The Economic Reserve —In the modern economy of specialization of effort and ownership the current fund of consumption goods, for the most part, has been lodged in the hands of a specialized class of wholesale and retail dealers and distributors. This reserve stock of goods is drawn upon daily by the workers at the machines whose efforts continuously replenish the stock on hand. But this reserve stock of goods cannot be drawn upon as rapidly as it is replenished, for to do so would mean stagnation in industry and eventual exhaustion of the fund through failure to replenish the capital employed in its production. In order to maintain this reserve of goods it is necessary that some must forego their privilege of consuming goods in favor of others who are engaged in the making of capital goods for maintenance and improvement of the technique of industry.

The technique of production is maintained and augmented only through the surrender of the privilege of consumption by the first group in favor of the larger group of workers while the latter is actively engaged in its task. It is in connection with this second group under our system of division of labor that the social process of investment arises. It is only in proportion as the first group exercises forbearance in its privilege of drawing on the current supply of consumption goods that investment can proceed. This constitutes the process of earning, saving, and investing under a society of specialized functions.

But still another step in the analysis of modern investment is necessary. In this *régime* of money and credit and exchange of goods one has come to think of all economic matters in terms of money value. One speaks of the income of the people as money income when in reality it is income in terms of consumption goods and services. Now these terms are coordinate when current consumption is equal to production. But when saving takes place, the *real* income of the economist must always be smaller than the money income. The surplus money income, the savings of the community, is impounded in purchasing power represented by monetary value. In the orderly progress of matters savings constitute a stream of purchasing power flowing into the hands of the group of workers above distinguished in return for their products and who in turn come into possession of the means of commanding the unused portion of the general stock of reserve consumption goods. On the other hand, those who have saved, those who have refrained from exercising the choice of consumption to the full extent of their privilege, have received capital goods in exchange for their sacrifices. They have made an investment. Thus it comes about that in a society of specialized effort capital is

lodged in the hands of a certain group who by their own volition have chosen this course. Moreover, the opportunity is open to each according to his own ability to follow a similar course. By far the greater number of workers themselves have to some extent, and at times at least, chosen to follow this course and have become to that extent owners of capital. They too have made an investment.

Consumers' Goods as Capital.—But in the development of the process of social investment it was found that one other duty devolved upon the owners of capital, namely, the carrying of the inventory of consumers' goods from the time it left the shops of the producers to the time it was taken from the reserve by the consumers. This involved a loss of time in the recovery of funds invested in the capital equipment itself. It rendered an increase in the amount of the total product that eventually accrued to the owners of capital to compensate for the loss of time. This function is indeed not peculiar to a capitalistic régime, for long before the appearance of productive capital in large quantities, goods produced mainly without the aid of capital had to be carried by some until they were wanted by the ultimate consumers. For this service the owners of capital funds were regularly compensated. The function common to both of these operations is the abstention from consumption by the owners of capital in favor of those exercising this choice. This process runs throughout the capitalistic system and reveals the true nature and processes of investment. It should be observed also that the carrying of consumption goods until the time they reach the hands of the consumer is an economic service to society. In the language of the economist, place and time utility are added to form utility achieved in the productive process.

Usage of the Term Investment.—The economic conception of investment is thoroughly in harmony with the historical evolution of the term. Surplus capital of early times was invested largely in ships, trade, and commerce. The traders of the seventeenth and eighteenth centuries in connection with the trade with India spoke of investing their money or capital in ships and goods. Writers of the period used the term in the same sense. In the nineteenth century Jevons spoke of "turning circulating into fixed capital, or less durable into more durable capital."

From the historic use of the term was evolved the modern conception of investment. No better, and certainly no more authoritative, definition has ever been advanced than that given in the *Oxford Dictionary* where investment is defined as "the conversion of money or circulating capital into some species of property from which an income or profit is expected to be derived in the ordinary course of trade or business." And again, to invest is "to employ (money) in the purchase of anything from which interest or profit is expected, now, especially in the purchase of property, stocks, shares, and so forth, in order to hold these for the sake of the

interest, dividends, or profits accruing from them" The essential points in this language are clearly (1) the conversion of money or liquid capital to economic ends and (2) the normal expectation of securing an income, be it interest or profit, from the services rendered by such conversion

Individual Investment—To conform to modern conditions, the idea of investment is extended to include reinvestment in the paper representatives of wealth, such as stocks and bonds, the income from which, in the language of finance, is referred to as interest or dividends It should be noted that reinvestments are in reality simply transfers of goods, or titles to goods, from certain individuals to others No new investments result from these operations Moreover, the transfer of titles in this manner may involve an amount of money greater or less than the actual investment—a situation of the greatest importance to investors It is only when the transfer of funds among individuals finally reaches the workers engaged in the production of new goods from which an income is expected that investment takes place It should be noted here too that investment is defined without reference to the risk element, a feature that will be important for later distinctions but unimportant at this juncture ¹

The idea of individual investment also includes financial operations the proceeds of which are not necessarily employed in productive enterprise or where the connection between its employment and future benefits is remote Included in this group are certain loans to governments, states, and minor civil divisions, as also private loans for consumption purposes, as, for example, the erection or purchase of a dwelling, the acquisition of an automobile, furniture, or other valuable articles which yield no income to the owner Loans of this general type, when not used for productive purposes, are generally spoken of as spendthrift loans There may be a difference of opinion as to the productive character of loans represented by the war debts of national governments If they are to be considered productive at all, it must be in a very general sense of the term It still remains true, however, that the governments concerned possess only the power of taxation for payment of interest and

¹ While in some cases not so explicit as the definition of investment above quoted, other dictionaries are in general agreement with the fundamental idea *Webster's New International Dictionary* defines investment as "the laying out of money in the purchase of some species of property, especially a source of income or profit," while to invest is "to lay out (money or capital) in business with the view of obtaining an income or profit" From the *Century Dictionary* one learns that investment is "a placing or conversion of capital in a way intended to secure income or profit from its employment"

R. H. Inglis writing in *Palgrave's Dictionary of Political Economy* under the title "investment" says, "The investment of money by an individual means either some form of lending the money at interest, or its exchange for property from which a profit, rent, or income of any kind is expected, whether this property is already in existence or is being produced by those to whom the money is paid"

principal. Such loans had better be considered unproductive for present purposes. The same may be said for state, municipal, and private loans for consumptive purposes. On the other hand, governments sometimes contract loans for the purpose of engaging in productive enterprise, as when a municipality owns its own water works or in the case of government ownership of railroads, telegraphs, telephones, and the like.

Scope of Investment.—Thus the scope of modern investment is as broad as the fields of private and public finance in so far as they relate to the employment of capital funds. The field of private finance is constituted largely of corporate securities of a diverse character, including the manifold types of stocks, bonds, and notes. It also embraces all farm and real-estate mortgages, bonds, and notes as well as such relatively new forms as certificates of investment and other trusts, bankers' shares, and the like. In the field of public finance come the obligations of domestic and foreign governments, states, and provinces, as also those of cities, counties, towns, and other minor civil divisions. Notwithstanding the heterogeneity of their type and character these multiform securities may be analyzed and appraised by a common method of procedure and by employing a set of principles and technique applicable to their common underlying elements of value. The possibility of establishing universal principles and technique applicable to all the various types of issues alike constitutes the *raison d'être* for an independent science of investment. The analysis following will make it abundantly clear that bonds themselves are far from uniform in quality and that in the voluminous catalogue of issues may be discovered bonds in quantity of any and all degrees of merit. Likewise stocks differ greatly among themselves, many of the better preferred issues exceeding in quality certain classes of bonds. In fact, the true mental picture of the multifarious kinds and types of security issues arranged according to quality reveals all gradations of risk from gilt-edged bonds to despicably worthless stocks. There is no impassable chasm separating bonds from stocks and no good reason can be found for the exclusion of stocks in a treatise on investment.

Motives in Investment.—The first motive in investment is the desire to preserve that which has been saved. In early economic life, leisure time represented the savings of individuals. This time was employed in the erection of rude dwelling houses and in the accumulation of food and materials for clothing. With the discovery of valuable metals, stones, and shells, all of which were at one time or another used for money, came the opportunity of preserving savings by acquiring these valuable articles and storing them away for future use in commanding articles of necessity for daily living. This was a poor method at best. With the coming of machinery and all of its accompaniments, great strides were made in the effect to preserve that which had been saved. Although money served this purpose for countless generations and is still

hoarded in times of great emergency, the chief method of preserving funds today is by investment in business enterprise. This is done consciously or unconsciously. When the stocks or bonds of an enterprise are purchased, the owner expects to be able to recover the amount so invested, and the process is a deliberate and conscious one. Many, however, especially the small savers, do not directly invest anything. They deposit their funds in a bank, or other financial institution, or purchase an insurance policy, little knowing that the money with which they parted is forthwith employed in the furthering of some enterprise. In one way or another, the surplus funds of society rapidly find their way to the managers of industrial establishments who employ them in the expansion of their operations.

It would, perhaps, be more accurate to say that investments are made with the intention of preserving funds. That funds are not always preserved when committed to industrial enterprise is familiar to everyone. The extent of the losses through bad investments, however, is not generally appreciated, nor does the investor always realize what the chances of success are. Before the World War the savings of the people of the United States, as estimated by various authorities, were around \$5,000,000,000 annually. How much of this was soundly invested is a matter of guesswork. The amount annually lost in worthless securities has been variously estimated from \$250,000,000 upward. Credit losses often run as high as \$500,000,000 annually. The actual fire losses amount to about \$250,000,000 annually. All told, it is probably safe to say that, on the basis of annual savings of \$5,000,000,000, approximately one-fifth is wasted. It appears then that the investment of funds in capital equipment is attended with considerable risk, and that this is at best an imperfect method of preserving funds. While this is true for the country as a whole, nevertheless, for the individual a proper selection of investments will avoid most of the risk involved. If the above percentage is applied to the past decade, the annual losses amount to huge proportions. With average national income, say, at \$80,000,000,000 and savings figures at one-seventh of income, the conclusion is reached that something like \$2,750,000,000 is wasted annually.

Investment for Income.—However important may be the preservation of funds, it is safe to say that few investments of today are made which do not turn largely on the matter of income. So important is this feature that the investment market has been aptly described as a market where incomes are bought and sold.¹ It matters not whether the securities concerned are stocks, bonds, or mortgages, all alike are unprofitable from an investment point of view except for the income they produce. And it is on account of this income that they serve the double function of acting as a storehouse for capital funds and of giving opportunity for

¹ SERENO S. PRATT, *The Work of Wall Street*, p. 59.

their profitable employment. Some incomes are fixed in amount and some are variable. To the former class belong most mortgages and mortgage bonds and preferred stocks, while to the latter group belong participating stocks and bonds and common stocks.

From the standpoint of pure economics the conception of income from investment is clear. It refers to the reward received by the owners of capital for the services of capital itself as a factor in the production of consumers' goods. The author has used the word "production" in its fundamental economic sense of creating utilities of either form, time, or place. While most capital is invested so as to alter the form of goods, large portions which are invested in carrying consumers' goods render their service by furnishing these goods at the proper place and time. Income thus arising from the services of capital must always hold the primary place in the scheme of investment. It constitutes, therefore, the main reliance of capitalists for the profitable employment of their funds. This rendering of a social service brings with it a social reward as measured by the willingness of the consuming public to buy the products of capitalistic production at such price that adequate reward will be offered the owners of capital. This is the economic basis, the impregnable foundation, of the entire superstructure of investment. This conception of income corresponds with the accountants' conception of earnings and excludes gains of the kind next to be discussed.

Even though investments and securities are valued generally for the income they produce, prospective or potential income must be distinguished from realized income. It is the characteristic of the first group of securities above named that the income is currently realized and fixed in amount so that no reasonable doubt arises in the mind of the investor as to its continuation in the future. But the second group of securities raises the question as to how great the income may be in the future. Investors have learned to be long sighted in such matters so that in their search for income they are quite as much interested in the future as in the present. It thus happens that in the purchase of securities of variable income a conscious effort is constantly made to anticipate the amount of the future income and to make due allowance ahead of time for increases or decreases in the amount to be realized. This simple principle, if borne in mind, will go a long way toward explaining values set upon certain securities that currently produce no income at all and others whose prospects are not bright.

One more point concerning income arises at this early stage of discussion. This has to do with the conception of income itself. What can fairly be called income in the investment field? Specifically it brings into view the practice of corporations in plowing back into the property large amounts of surplus earnings instead of distributing these to the security holders. On the average, American corporations have for years

considered it expedient to retain something like 40 per cent of their net earnings after payment of expenses and interest on fixed-income securities as surplus. While legally the property of the corporation, nevertheless this surplus represents the equity of the participating security holders. The profitability of investment, therefore, cannot be fully measured without regarding this as a part of the reward. In their financial operations investors constantly take this unrealized income into consideration when calculating the price they are willing to pay for securities.

Profits — There is, nevertheless, another way of gainfully employing capital funds. It consists in gains through changes in capital value. These accrue to the owners of capital through two processes not always clearly distinguished from each other, namely, appreciation and depreciation, on the one hand, and accretion and decretion, on the other. Appreciation of principal takes place only in those cases where there is a certain amount of risk involved at the time of purchase. If the risk inherent in the issue is later lessened through improved credit of the issuing body, the price of the issue improves accordingly. The investor has thereby gained to the extent of the increase in price. Such gains may be realized either through sale of the security or, in the case of debts, at the time the obligations come due.

The principle of accretion is often confused with appreciation. Accretion, like appreciation, is an increase in the price of an issue, it results, however, not from causes inherent in the security itself but from external circumstances. The most common case of accretion is where the price is affected by favorable changes in the money and capital markets. In times of panic or crisis, the best bonds sell at a low price because of the efforts of their owners to realize cash funds from their sale. This causes a temporary glut in the market which is further aggravated by the general scarcity of buyers. Subsequently, when the main effect of the panic or crisis is past, improvement in price is considerable. Those who bought at low prices are recipients of substantial amounts of income through the process of accretion. Accretion is found in all types of securities but especially in bonds and stocks because they are long-time investments.

Investment losses occur from three causes which correspond to these sources of gain. First, losses sustained through failure of the borrower or user of the funds to pay the interest or dividends on the investment. Second, losses are often sustained through deterioration in credit, which is reflected in a reduced price. These may be designated as losses from depreciation. Third, losses may result through the purchase of investments made at a time when high prices prevailed, and which were later disposed of when prices were unfavorable through no fault of the user of the funds. These losses are the opposite of accretion and may be called losses from decretion.

Speculation Distinguished from Investment.—Having acquired a clear idea of the economic use of the term "investment," one should have little difficulty in understanding the meaning of speculation. The best approach here as in the former case is to examine the authoritative and generally accepted meaning of the term. To quote the *Oxford Dictionary* again, investment is distinguished from speculation "in which the object is the chance of reaping a rapid advantage by a sudden rise in the market price of something which is bought merely in order to be held until it can be thus advantageously sold again." Speculation is the "practice of buying or selling goods, land, stock and shares, and so forth, in order to profit by the rise or fall in the market value, as distinct from regular trading or investment, engaging in any business enterprise or transaction of a venturesome or risky nature, but offering the chance of great or unusual gain."¹

The difference between investment and speculation is expressed by H C Emery² as follows "Investment means primarily the purchase of income-yielding property in order to get an annual income, rather than to make profits from the fluctuations in capital value." Speculation "consists in buying and selling commodities, or securities, or other property, in the hope of profit from anticipated changes in value." So Pres A T Hadley says, "Speculation, in the narrow sense of the word, is the attempt to make money out of fluctuation in the value of property, as distinct from its earnings."³ One may also quote from Lavington who says, "It is not entirely satisfactory to let the distinction turn on a question of intention, but such a course is, perhaps, better than its alternatives. We may, therefore, define the speculator as one who carries between two points of time with a view to profiting from a price difference between the two exchanges bounding his operation."⁴

¹ *Webster's New International Dictionary* defines speculation as "engaging in business out of the ordinary, or dealing with a view to making a profit from conjectural fluctuations in the price rather than from earnings from the ordinary profit of the trade, or entering into a business venture involving unusual risks for a chance of an unusually large gain or profit."

The *Century Dictionary* defines speculation as "the investing of money at a risk of loss on the chance of unusual gain, specifically buying and selling, not in the ordinary course of commerce for the continuous marketing of commodities, but to hold in the expectation of selling at a profit upon a change in values or market rates."

The *Encyclopaedia of the Social Sciences*, under the term of gambling defines speculation as "the act of buying or selling commodities, securities, or rights in order to benefit from changes in their prices."

² *Speculation on Stock and Produce Exchanges of the United States*, p. 96.

³ *Principles of Railroad Transportation*, p. 48.

⁴ F LAVINGTON, *The English Capital Market*, p. 235.

On the other hand, Sereno S. Pratt finds the difference between investment and speculation lies not only in the method of securing an income but also in the amount of risk assumed. "Income and safety are essential in investment, risk and profits, in

These definitions are in general agreement on two points. (1) speculation is concerned with fluctuations in capital values, and (2) the intention of the speculator is to make a profit out of these fluctuations. It may be added that the speculator, unlike the investor, makes no attempt to render an economic service to society. In some instances (see footnote) the risk element receives emphasis but is generally not made an essential characteristic of speculation. As a matter of fact, more risk is usually assumed by the speculator than by the investor. Mr Hastings Lyon, while resting his main distinction on the intention of the capitalist, prefers to let the intention be inferred from the amount of risk assumed.¹

The investor and speculator may, and commonly do, deal in identical issues. In the past both the conservative investor and conservative speculator have generally confined their transactions to bonds and similar issues while the more liberal minded of both classes have always included a considerable portion of preferred and common stocks in their dealings. The conservative investor looks for no increase in income but centers his attention (often to his sorrow) upon its steadiness and safety, while the conservative speculator seeks to purchase relatively safe stocks or bonds, depending upon price change for his main profit. On the other hand, the liberal investor purchases stocks of merit with the expectation of reaping the increasing profits through future years, while the liberal speculator may deal in similar issues but always with the idea of reaping extraordinary profits through price changes. To pursue the contrast still further, the investor may receive profits through occasional or unexpected sale, while the speculator may reap gains from liberal disbursements of corporations, although both of these results are incidental to the primary motives.

Risky ventures often result in great gains as well as great losses; hence this type of investment lends itself easily to illustration of speculation, hence the emphasis placed upon the risk factor by some. But the essential distinction between investment and speculation is always to be found in the motive back of transactions. To repeat once more, investment consists in the purchase of income, while speculation has as its object the making of profits from price changes.

But price changes occur quite as frequently from forces in the money and capital markets as from forces inherent in the security itself. Hence

speculation. To secure profit the speculator is willing to take larger risks than the investor."—*The Work of Wall Street*, p. 81.

Greater emphasis is placed upon the risk element by Lawrence Chamberlain in his work on the *Principles of Bond Investment*. He says the difference consists merely in the "degree of risk willing to be assumed."—Revised and enlarged edition, p. 13.

¹ *Investment*, p. 12. Chapter I of this work gives an unusually good discussion of this matter.

the speculator seeks also to take advantage of changes from this cause and often confines his operations to bonds instead of stocks

Speculative Investors.—Somewhere between the investor and the speculator stands the speculative investor. This class has a divided, or double, motive made up of a nice balance between the two motives suggested by the term itself. It includes those investors who are not Simon pure but are influenced to a more or less degree by the speculative motive. Speculators similarly are often influenced by motives of investment and may then be classed as investive speculators. Observation seems to point to the conclusion that besides institutional investors there are nowadays few Simon-pure investors or speculators but rather most individuals are actuated by a combination of the two motives. Some have contended that such actuations are psychologically impossible. Common experience, however, would dictate that mental decisions of this character are of daily occurrence in all human activities. With good reason it may be pointed out that the compromise position is frequently wrought with peril to the once Simon-pure investor who, having attained moderate success in his speculative investments, rapidly deteriorates into the out-and-out speculator, often to his own detriment. Thus, however, is a matter of investment policy and has nothing to do with logical distinctions.

Risk and Risk-bearers.—It seems appropriate here to observe that one of the first steps in acquiring a knowledge of investment is to learn that all investment operations, no matter what their nature, are attended with a certain degree of risk. There is no such thing as absolute 100 per cent safety in investment. All economic values are constantly changing in response to a thousand and one different causes. The farmer assumes the risk of the seasons and the conditions of the market for his products, the merchant risks the fickleness of the public demand for his articles, as well as the tactics and skill of his competitors. The empire builders risked the settlement of the new territory through which their roads ran and generally waited long for their reward. No great strides in industrial progress were ever made without the assumption of large risks on the part of the owners of capital, the managers, and the promoters. The omnipresence of the risk factor, perhaps, needs no stressing for the average business man. Present-day writers commonly place great emphasis upon it as it affects modern industry. The neglect of adequate analysis of this element is, therefore, a most serious defect in present-day investment literature, and the superficial practice of rigidly classifying investment issues into safe and speculative types reminds one once more of the old attempt at squaring the circle.

The economic view of investment is broad enough to admit of the risk element in all cases. It makes little difference as to the degree of risk which capital bears; as long as it represents a *bona fide* attempt at produc-

tion and service to the people, it deserves to be considered an investment. Investment is made in order that the productive capacity of people may be augmented and the economic status of society improved, or at least maintained at its present level. Certain issues, however, may be spoken of as "investment" issues, others as "speculative," inasmuch as the limitations of language force some such usage. Whatever the names used, it may be repeated that there is no investment which is unconditionally safe, 100 per cent good.

If it is inevitable that industrial progress be accompanied by uncertainties, it appears that the criticism which is frequently leveled at the risk-bearers of society is ill considered. Those who assume risks are often referred to in derision as speculators and gamblers. The evolution of modern investment has made it possible for each investor, according to his inclination, to assume whatever amount of risk he desires. It has thus come about that investors have been more or less separated in the mind of the public into two general classes: pure investors, and speculators. Doubtless there are many who have made unwise choice by constantly assuming a larger part of the inevitable risks of industry than their means warrant, they can ill afford to accept their losses. Nevertheless, the choice between different types of investment, which makes it possible to assume little or much risk, is a distinct advantage to all concerned. The great need is education in investment matters, so that those incapable of assuming risks are not misled through ignorance. The present large class of ne'er-do-wells will diminish in proportion as they acquire some elementary principles to guide their conduct.

Gambling Distinguished from Speculation.—While the difference between investment and speculation is clear, the distinction between speculation and gambling is not so clear. Speculation gradually shades into gambling. Let us again consult authorities for our starting point. The word gambling is defined by the *Oxford Dictionary* as consisting of playing "games of chance for money, especially for unduly high stakes, to stake money (especially an extravagant amount) on some fortuitous event." So also *Webster's New International Dictionary* says to gamble is "to stake money or any other thing of value upon an uncertain event, to hazard something upon a chance." We have also the *Century Dictionary* which says to gamble is "to play at any game of hazard for a stake, risk money or any thing of value on the issue of a game of chance, by either playing or betting on the play of others, hence to engage in financial transactions or speculations dependent for success chiefly upon chance or unknown contingencies" as "to gamble in stocks." The *Encyclopaedia of the Social Sciences* (in the article on gambling) says "The term gambling designates the deliberate wagering or staking of important or valuable considerations upon events which, so far as the parties to the wager can know, lie in the realm of pure chance, or luck." The central

point in all of these definitions is that gambling turns on the element of chance. With this distinction as the cue, one may distinguish gambling from speculation in that the former turns upon pure, or blind, chance while the latter connotes rational calculation of probable future results. Pratt correctly characterizes speculation as "intelligent risk" while "gambling is blind chance."¹ In the language of Theodore Price, speculation is "hazard plus intelligence," and gambling is "hazard without intelligence." The gambler in finance is, above all, the blind chance-taker. As has been shown, the speculator calculates the risk involved in a transaction and assumes it knowingly with the hope of correspondingly great reward. The gambler either cannot or does not calculate the chances of success or failure. He takes a chance on the unknown or unknowable. An illustration of the dice will make the point clear.

One who has even the most elementary knowledge about the law of probabilities knows that with a single die, on the average, the six face will appear once in every six throws, because there are six faces to the die with as many different numbers. Conscious then of the certainty of any single number appearing once in six throws on the average, the odds of one to six may be taken on an unlimited number of throws with the certainty of neither losing nor gaining. If the odds could be secured on the basis of one to seven, there is nothing more certain than that in the end gains would result. The person who thus calculates and acts accordingly cannot be said to gamble. Neither is one gambling if one takes the odds on a comparatively few throws, because the chances of success are taken with open eyes. In this case, however, the operator of necessity assumes a certain amount of risk based upon the known facts, the risk, however, is of the speculative kind. When more than one die is used, it requires considerable mathematical ability to be able to calculate the chances of certain combinations appearing. Few there are who know these chances; still fewer are able to calculate the probability of any combination appearing at a single throw. The odds which in the long run would lead to an even break are accordingly unknown. Intelligent risk-assumption is, therefore, out of the question, and the one who takes a chance under these circumstances is taking a blind chance. He is gambling. Should he by sheer experience learn the probabilities involved in the case and take odds accordingly, he would then be assuming speculative risks and could not be accused of gambling.

The financial gambler is in precisely the same position as other gamblers. Stocks and bonds bear various degrees of risk which can be determined with approximate accuracy by careful analysis. The chances of success in any one issue, therefore, may be determined; he who commits his funds with his eyes open, with the hope of profits, assumes only speculative risks. The purchaser of stocks and bonds on this basis is in

¹ SERENO S. PRATT, *op. cit.*, p. 81.

exactly the same position as the purchaser of real estate, provided he has learned to calculate the risks involved. But the inexperienced who buy either real estate or stocks, not knowing the chances involved in either case, assume more than speculative risks, theirs is the gambler's chance. Careful analysis of the risks involved in the numerous types and shades of security issues will lead to the avoidance of gambling and the intelligent assumption of speculative risks.

Wall Street is full of gamblers. In former times their numbers were estimated at 75,000 on the average. During the days of the "new era" they must have numbered in the hundred thousands. But they are not gamblers because they buy and sell certain stocks and bonds. Neither are they always gamblers merely because they are ignorant of the degree of risk attached to the stocks in which they deal. What then is it that makes the typical patron of the brokerage house a gambler? In spite of what has just been said, it is the assumption of unknown and generally unknowable risks. The marginal trader in stocks deposits, say, 20 per cent or more of the market value of the stock which he purchases. If the stock declines so as to wipe out all, or the greater portion, of his equity, he is called upon to bear the loss if unable to supply additional funds. Anyone who would undertake to predict the immediate course of the stock market would be a very bold and irresponsible man. Daily movements are beyond the calculation of even the most practiced observers and operators. Herein lie the conditions that make marginal trading for the typical person mere gambling. The character of the stock has little to do with the case. Short-time fluctuations affect good and bad stocks alike. The margin which has been placed with the broker represents quite generally all of the resources available for such purpose. When it is exhausted through current fluctuations in the market, there is nothing left for the trader but to accept the loss, even though it leaves him financially stranded. It is the incalculability of the market risk, in connection with the powerlessness of the trader to cover when the market goes wrong, that is the core of financial gambling. One may gamble in Union Pacific common, as well as in Auburn, or one may invest or speculate in Auburn as well as in Union Pacific common. Needless to say, a treatise on the principles of investment is little concerned with the gambler. Its function is the establishment of fundamental principles affecting *bona fide* investments.¹

¹ Professor Emery distinguishes speculation from gambling on the basis of the character of the risk assumed. He says, "Gambling consists in placing money on artificially created risks of some fortuitous event, speculation consists in assuming the inevitable economic risks of changes in value"—*Op cit*, p. 10.

Chamberlain finds that gambling is distinguished from speculation in that it involves an ethical consideration. "the difference between them is the difference in motive, and in the degree and character of the risk."

Common Ground.—Regardless of their different points of view, investors and speculators generally meet upon common ground. Both alike are vitally interested in income, price, and risk. The success of each depends upon the ability to appraise the element of risk. This applies to the risk inherent in the issue itself as well as the risk attendant upon the security markets.

Only a moment's reflection is needed to realize how important are price and price changes even to the Simon-pure investor for income. If investments were always held till maturity, price changes could be neglected entirely for the sole concern of the investor would be the safety of interest and principal. But modern investors are interested quite as much in the continuous liquidity of their investments without loss. This demands constant attention to price changes. Analysis of the speculator's position likewise reveals a paramount interest in income, or yield, since this is the vital force in price determination.

In view of the universality of interest in income, price, and risk, one approaches the subject with attention focused upon these pivotal problems of investment.

Investment and Finance.—One more distinction needs to be made before closing this introductory chapter. Some find it difficult to make a clear distinction between investment and finance. This is more or less natural from the fact that investment is the newer of the two and sprang from the older subject of finance. This was merely one more step in the long history of the evolution of the many sciences of today. Suffice it to say that the science of investment has progressed sufficiently far to give it an independent position in the realm of economics. It remains to characterize investment with reference to corporation finance.

The most obvious point of difference between investment and finance lies in the much broader scope of the former over the latter. Investment brings within its purview not only security issues of railroad, industrial, and public-utility corporations but includes also the stocks or bonds of insurance companies, banks, and investment trusts, as also issues based on farm lands and urban real estate. It embraces in addition the securities of national, state or provincial, and local governments.

A second distinction is found in the point of view assumed. The investor is interested in stocks, bonds, and mortgages for the amount and stability of the income they will produce, while the corporation looks upon these instruments merely as methods of raising money. The investor is interested in the economic values lying back of his securities conditioned upon certain legal priorities, limitations and privileges, and moral presuppositions.

• Finally, the investor is interested in changes in the general financial and economic conditions and their effect on prices and values independent of the intrinsic merit of the issues themselves.

On the other hand, corporation finance deals with the financial aspects of business enterprise. Its central purpose is to establish principles which govern the raising of funds in the way most advantageous to the business organization. Corporation finance seeks to show how the various types of security issues with their limiting conditions are adapted to the functional needs of business. It has to do with the adaptation of issues in such a way as to avoid insolvency with its consequent losses and other handicaps and to extricate the business from such a calamity when it actually makes its appearance.

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CHAPTER II

MODERN INVESTMENT

In this chapter are treated the leading characteristics of modern investment. It will be helpful at the outset to summarize these outstanding features of finance as follows: (1) intangible character of investment, (2) division of interest and ownership in business, (3) transferability of interests, (4) absentee interests, (5) separation of interests from management, and (6) division of risk and income. From these characteristics have evolved all of the multifarious types of securities found on the market today, the institutions of investment banking, and security exchanges. The evolutionary development of these leading features and facilitating institutions forms an indispensable background to an understanding of modern investment.

Intangible Character of Modern Investment.—The most impressive and all-pervasive feature of modern investment is its intangible character. It is this feature that has made possible the other leading characteristics. The intangible titles to property have rendered division of interests and ownership possible, the transfer of that ownership, the separation of control from ownership, the division of risk and income, and absentee ownership. It has made possible the participation in ownership of wealth by the general public without the incumbrances of the usual incidents of ownership. The field of investment today presents a vast array of wares of all conceivable qualities and features, so that the investor has ample choice in satisfying his needs and whims.

Perhaps the earliest examples of investments similar to those of today were loans secured by liens on property. These were current in ancient Babylon in 2200 B. C. One of the earliest examples of investment in the modern sense was in connection with the tax-farming associations in ancient Rome. The collectors of taxes sold shares in their enterprise to capitalists who participated only in the profits of the undertaking. With funds thus obtained, the collectors purchased the right to collect taxes from the public authorities. The shares of the associations were transferable and seem to have been objects of public speculation.

Of greater proportions were the transferable loans of the mediaeval Italian cities, particularly of Venice, Florence, and Genoa. The Bank of Venice acted as fiscal agent for the city debt as early as the twelfth century. We also have mediaeval records of the loans of the French Government and of the city of Paris.

In modern times the quantity of intangible wealth has become an imposing sum and tends to grow larger and larger. As late as 1854, however, the secretary of the treasury estimated the total intangible wealth of the United States, exclusive of real-estate mortgages, to be only \$1,178,597,000, or 16 per cent of the total wealth in 1850, which was officially placed at \$7,135,000,000. Charles A. Conant in his *Wall Street and the Country* estimated total railroad stocks and bonds outstanding in 1873 at \$3,784,543,034 and securities of manufacturing companies at \$2,118,208,769. With the development of industrial enterprise, the growth of federal, state, and local indebtedness, real-estate and farm mortgages, and foreign investments, the total intangible wealth today has grown to the huge sum of \$242,000,000,000 against wealth officially placed at \$320,000,000,000, or 75 per cent of the total. Intangible wealth has thus grown much faster than tangible property during the past three-quarters of a century.

Intangible wealth is a general characteristic of modern industrial civilizations. Conant estimated that the negotiable securities of the world in 1897 amounted to over \$100,000,000,000, of which about \$86,000,000,000 were listed on the European bourses alone. In 1918 Professor Pigou estimated that 60 per cent of English wealth was represented by intangible securities. The total obligations contracted by the governments of Europe since the beginning of the World War exceeded \$185,000,000,000.

The Evolution of Modern Investment.—Modern investment may be said to have had its beginning with the money *régime* in the early mediæval times. When money became sufficiently plentiful so that transfers of land and other valuable property were made for a money consideration, one has the first stage in modern investment. This involved the exchange of liquid capital for fixed capital. In order to preserve capital in liquid form, the proceeds of such sales were commonly invested in plate and jewelry. In this way funds were not only preserved but the wares themselves were sources of great satisfaction and pride. But owing to the general insecurity of the times "moneyed men" often sought to make their funds safe by depositing them with the goldsmiths, who were the progenitors of the modern bankers. In this stage of development investments bore a negative interest, that is, the owners of plate and other ware paid the goldsmiths for their service of safekeeping.

As pointed out by Powell,¹ the financially timid or conservatively inclined people continued for several centuries to deposit their wares with goldsmiths. But, on the other hand, already in the fifteenth century many capable craftsmen by self-denial, or otherwise, accumulated a modest capital which was made the basis of their own private undertakings. In other cases moneyed men backed young craftsmen with

¹ E. T. POWELL, *Evolution of the English Capital Market*, p. 31

their funds, while in some instances money was invested abroad in countries more advanced commercially than England. The latter steps mark a distinct advance over earlier times when money was sometimes lent for consumption purposes. Now money was employed for productive purposes and this changed the public and legal attitude toward the problem of usury. Moneyed men could now claim interest on the ground of *damnum emergens* (losses sustained) or *lucrum cessans* (profits foregone). Yet hoarding continued to increase on a large scale and this practice gave the influential goldsmiths of the sixteenth century their opportunity. One writer of the day stated that in one street of London "there are fifty-two goldsmiths' shops, so rich and full of silver vessels, great and small, that in all the shops in Milan, Rome, Venice, and Florence put together I do not think there would be found so many of magnificence that are to be seen in London"¹. The goldsmiths thus became the leading money lenders of the time and as such were among the most influential people of the day.

Even in these early times some of the chief traits of modern investment can be discerned. Especially sagacious individuals preferred to assume the responsibility of their own funds and their course doubtless was the more profitable also. For instance, it is known that Shakespeare employed most of his accumulations in the purchase of real estate in Stratford; some of his funds, however, were invested in the unexpired term of 31 years of a 92 years' lease of "moiety of certain local tithes," returning him something like 9 per cent on the investment. The chief point of interest in this and similar cases is that the moneyed man was able to employ his funds profitably in several ways outside the personal conduct of a business enterprise. This placed the capitalist in a position of comparative freedom from care and released him from any occupation connected with his money, thus permitting the development of salaried or personal occupations. This condition of detachment from one's money while it was earning a return gave rise to the capitalist investor as distinct from capitalist *entrepreneur*.

The Joint-stock Company.—Although loans to governments existed throughout mediæval times, they do not form a direct link in the chain of evolution of modern investment. All such loans were for purposes of consumption, the proceeds generally being used in the prosecution of wars. The line of descent in investment is rather along the development of business enterprise and here the progenitor of the present-day corporation, the joint-stock company in England, plays an important role.

The earliest example of the joint-stock company in England was the Mines Royal Company incorporated in 1565 after much solicitation from Queen Elizabeth. This marks the beginning of the joint-stock company with transferable shares and a corporate existence independent and

¹ *Loc. cit.*

separate from the shareholders (in this case there were 50 shares) ¹ A second incorporation of the time was the Battery Works, which was a virile organization and established precedents for assessing members, the right to borrow on bond bearing a seal, and the adoption of a stock-transfer book Not so very long afterwards appeared the great monopolistic chartered corporations, the East India Company, the Royal African Company, and the Hudson's Bay Company, all issuing stock certificates

In spite of these early examples of crown-sanctioned corporations, the incorporation of business enterprises for general business purposes did not meet with favor until a century or more afterwards However, the unincorporated joint-stock company for the transaction of domestic business was spreading rapidly It encountered great legal and royal opposition and, "if unincorporated by special exercise of the royal authority, it was nothing more than a partnership on a large scale" ² The ablest legal talent of the day was employed in an effort to place unincorporated companies on the same basis as those incorporated by crown This implied continuous existence, transferability of shares, the elimination of liability of shareholders for actions of their fellow shareholders and of the right of individual shareholders to deal with the assets of the association

The legal antipathy to joint-stock associations discouraged the formation of these companies Especial opposition was encountered on account of their exercise of the principle of limited liability and the transferability of shares This opposition culminated in the Bubble Act of 1719 which attempted to annihilate them entirely The grounds for this act were (1) unwarranted presumption of corporate existence, (2) the sale of transferable stock, and (3) engaging in activities beyond their presumed powers But this act was repealed in 1825 simply because with the advent of the industrial revolution their formation became necessary in order to provide sufficient capital for the expanding enterprises of the day It may here be pointed out that the real abiding reason for the joint-stock form of enterprise was and still remains the necessity for the accumulation of social capital The principle of limited liability was after all only an incident, though an important one, the existence of which was a prerequisite to attract capital in amounts sufficient for the purpose in hand This can be fully appreciated only when we are mindful of the fact that without limited liability associated enterprise incurs the liability of the individual for the debts of the multitude, a situation not to be contemplated by careful investors.

But joint-stock companies had to labor under the handicap of unlimited liability until 1855 when it was made possible to obtain a

¹ *Ibid*, p 169

² *Ibid*, p 174

certificate of limited liability merely by registration for all but insurance companies ¹

Corporations in the United States.—The thread of history of the American corporation runs back to colonial times. The number of corporations in those days, however, was negligible. A few were chartered by the crown, while a few others of domestic origin existed under great legal opposition from England. The prerogative of the crown in granting charters was a tradition in England although Parliament had the right to confirm charters. Rightly or wrongly, however, some of the colonies in a few cases had granted charters to business corporations. In 1732–1733 the “New London Society United for Trade and Commerce” was chartered in Connecticut and was the first business corporation in America. In addition to legal obstacles to incorporation, among the unfavorable circumstances were (a) the smallness of the business organization of the day, (b) independence of the temper of the people, (c) backwardness of technique of production, and (d) a limited amount of capital available.

After the American Revolution things changed rapidly. Independence and freedom of commerce and trade were the normal signals to political independence. Then there was the new immigration and the disbanding of the revolutionary army, both of which furnished a new supply of labor. The Napoleonic wars led to a boom in the foreign trade of the United States. This together with the trade with the West Indies resulted in large accumulations of capital in the leading cities of Philadelphia, Boston, New York, and Baltimore. Here wealthy traders and ship owners arose who supplied several millions of investment funds annually. This new supply of labor and capital created employment in a variety of corporate undertakings. Prominent among the business enterprises of the day were the banks established during and after the revolution. Among the earliest of the American corporations was the Bank of North America, chartered originally by Congress in 1781 but supported in its legal position by charters by Rhode Island, Connecticut, Massachusetts, Pennsylvania, New York, North Carolina, and New Jersey. In 1784 the Bank of New York was established. The stocks of both of these banks came into the investment and speculative markets of the day. Several other states also established banks in early periods. Charters were also granted to insurance companies, canal and other internal improvement companies, turnpike, bridge, water, and even a few business corporations appeared in the eighteenth century, so that by 1801 there had been granted charters to about three hundred corporations for various activities. In those days charters were granted only by special act of the legislature, so that the business of granting charters became a matter of absorbing routine for legislatures. The complexion of

¹ *Ibid.*, p. 185

American corporations at the close of the century is revealed by the following table

TABLE 1—CORPORATE CHARTERS GRANTED IN THE EIGHTEENTH CENTURY

Where granted	Finance	Highway	Local public service	Business (proper)	Total charters
United States	2				2
New England	33	130	30	8	200
Middle states	16	42	4	5	67
Southern states	16	47	2		65
Western states		1			1
Total charters	67	220	36	13	335

J S DAVIS, *Essays in the Earlier History of American Corporations*, Vol II, p 24

Most of the prominent men of the day were the active leaders in building up pioneer American enterprise Washington, Hamilton, Morris, and others were actively engaged in the affairs of banks, turnpike, canal, and other business corporations Corporations performed a public service in developing American industry in its pioneer days and gave employment to American labor and capital. It was these purposes that offset the public attitude of hostility born of an earlier English sentiment directed against monopolies which were themselves personified by corporations This tradition, however, was gradually broken down with the advent of general incorporation laws and free incorporation by certificate, which threw American enterprise open to all who cared to take part in its development

Features of the Corporation.—The introduction of the joint-stock company in England and the corporation in the United States worked a revolution in business and economic development. It made possible the development of the chief features of investment of today. Under simple methods of production, before the advent of machinery on a large scale, all of the factors of production were united in a single person This was the day primarily of the individual or partnership form of business organization The proprietors owned and managed the business and did most of the labor themselves, therefore, the significant problems of modern investment did not arise But with the increase in inventions came the introduction of more costly and complicated machinery and the phenomenal development of transportation, so as industrial progress in general proceeded, larger and larger units of capital became necessary. A more complex and refined business organization became indispensable. Labor was assigned its modern function, management was placed in the hands of the few who showed special aptitude in this direction, and the ownership of industry gradually became lodged in a third group.

The amount of capital demanded by a modern industrial organization is so large that it can no longer be supplied by a single individual or even a small group of individuals. The individual and partnership forms of organization have, therefore, given way to the joint-stock company, the corporation, the holding company, the trust, and the more refined form of the community of interests. Among these, the corporation is the center of interest. It combines the fundamental requirements of modern business, retaining a degree of flexibility suitable to the most varied needs. For the investor, also, the corporation possesses distinct advantages over other forms of organization. Through the principle of limited liability, it confines his possible losses to the amount of money invested. Through the issue of stocks and bonds of small denominations, it admits an unlimited number of individuals to partial ownership, thus securing for many thousands of investors, both large and small, an outlet for their savings. Furthermore, the corporation makes the transfer of individual interests easy while not disturbing the organization of the business unit.

Separation of Ownership and Management.—In the days when the individual and partnership forms of business organization prevailed, ownership and management of enterprise went hand in hand. Indeed there was opportunity to employ one's funds profitably without assuming any business responsibility by lending upon real estate, to the government, or by personal loans. But the amount of capital employed in this way must have been small indeed. The most common as well as the most profitable employment of capital was in the conduct of some form of manufacturing or trading enterprise. But this required the combination of business talent and capital in the same individuals. The corporation changed this identity of ownership and management. With the separation of ownership from management of industry appeared the chief problems of modern investment.

To be sure, the stockholder accepted the legal responsibility of election of the board of directors but there is little evidence that this duty was ever taken seriously. On the contrary, the function of the holder of a share of stock did not differ much a century ago from today. There is no evidence that the stockholder ever regarded his legal right of management as anything beyond a mild veto power. In practice the board of directors and officers then, as now, elected themselves and exercised a free hand in the management of the affairs of the corporation. In the days of the small corporation with a limited number of shareholders, however, it frequently happened that most of the stockholders were likewise members of the board of directors and held the offices. The active management was almost invariably in the hands of a single officer elected by the board of directors. Today with the multitudinous numbers of stockholders in the typical corporation there is little immediate control of the enterprise by the stockholders themselves although their legal right to elect directors

still prevails. Even the board of directors itself exercises little active control over the responsible officers and in the nature of the case it would be unwise for such a control to exist. Perhaps the true function of the board is the exercise of the veto power which was a former function of the stockholders and which today in practice is all but lost. But where the members of the board of directors serve also as officers or on management committees, the connection is closer and this represents a distinct step in advance.

Whatever real power is exercised by the stockholders in modern corporations is exercised upon the principle of majority rule after the analogy of political control. This rule of the majority in business affairs has given a social aspect to modern enterprise. The individual, whether he be stockholder or bondholder, cannot do as he will with his property when it is combined with others' property in the corporate form of organization. The extent of control by shareholders is limited to the right exercised through the rights conferred by ownership.

Nevertheless, the capitalist of today performs a distinct function in the ultimate direction of business enterprise. He does this through his choice of fields into which he places his funds. Almost the sole test applied is that of the safety and profitableness of the respective enterprises bidding for his funds. Investment with him is almost entirely impersonal in character. He may not even know the names of the leading officers of the corporation but makes his choice solely on the basis of the probability of success of the enterprise tested by certain standards which he believes to be measures of success. The enterprise that promises most in the way of security and profit is the successful bidder for funds. It is this specialization of function in the employment of capital today, with its chances of success and failure, that is a striking note in modern enterprise and lends peculiar flavor to modern investment.

Risk and Income.—Among the features of modern corporate securities is their variety and countless detailed provisions appearing in all sorts of combinations designed to meet the demands of the general public. These different types of issues together with the detailed features are designed chiefly to apportion the elements of risk and income to suit all needs. Where little or no risk is assumed, the income is also limited, and where large risk is assumed, the promise of income is also large. With this in view, corporate securities may be roughly divided into four leading types: mortgage bonds, debenture bonds, preferred stocks, and common stocks. Mortgage bonds with their lien upon assets and priority of claim upon earnings are the soundest and safest issues but carry the lowest rate of interest. Debenture bonds lack the soundness of mortgage bonds in that they give no lien upon assets and have no priority of claim upon earnings, while the coupon rates are somewhat higher. Preferred stocks likewise sacrifice security in that their claim upon earnings and assets is

junior to bonds and debts of all description. The stipulated dividend rate, however, is higher than the interest rates on bonds. Common stocks represent the residual share of the earnings and assets after the claims of all creditors and preferred stockholders

Weakness of Corporate Form of Organization.—It was Adam Smith who over a century and a half ago pointed out the inherent defects of the corporate form of organization. He says stockholders seldom understand anything about the business, and care not, but are satisfied only to let directors declare dividends. Further, because directors "watch over other people's money" they take less interest in it. This pioneer *laissez faire* economist also pointed out that, in order to succeed, corporations had to be beneficiaries of monopolistic privileges. It must be said in favor of this criticism that the experiences of the time both in England and on the continent amply bore out these conclusions.

But the failure of corporate activity of the time did not result in the abandonment of that form of organization as was freely predicted. On the contrary, corporations have grown most rapidly under the development of the very conditions which have always been their weakness. Even today the wide dispersion of bonds and stocks among the public has in no wise lessened the rate of growth of this form of business unit. Rather have the forces of publicity of corporate affairs and public regulation in the fields of banking, public utilities, and railroads served to bring out the best in management. Success or failure is no longer a secret in American typical enterprises. Neither should one be blind to the newer feeling of trusteeship which is making itself felt in some of the largest units of American business and inspiring men to give their best in the service of the general public. It should be remembered, too, that the stockholder still has the ultimate control through his voting power.

Public Debts.—Here the narrative of the development of American investments must be broadened by including public debts. The revolution gave opportunity for investors to place their funds in public obligations. The Continental Congress and state governments incurred obligations to the extent of \$51,000,000 of which \$11,710,000 was held abroad. These immense sums were raised only through the efforts of Robert Morris at home and Benjamin Franklin in France and Holland where supplies were purchased. These debts were all refunded under Hamilton's supervision when the federal government was established.

Although domestic accumulation of capital had received a great impetus following the war, foreign sources continued to be more important down to the War of 1812. The \$15,000,000 paid for Louisiana Territory in 1803 was raised mostly in Holland. In 1805 English investors still held \$28,500,000 of United States Government bonds. Toward the close of the wars in Europe profits to American business men had been so great that most American securities held abroad were reacquired at

favorable figures. The redemption of large portions of the federal debt and liquidation of the First Bank of the United States aided the repatriation of American securities held abroad. The merchant and shipping princes of the time, prominent among whom were Stephen Girard, John Jacob Astor, and David Parish, furnished most of the \$16,000,000 loan in 1813 to carry on the war with England. So when the Second Bank of the United States was established in 1816, large capitalists furnished most of the funds.

The Period 1820-1860.—Beginning about the third decade of the nineteenth century with the completion of the Erie Canal in 1825 and its immediate phenomenal success, the country enters upon a new era of financial development. Other internal improvements on a large scale were undertaken. The golden era was at hand. Easy access to the West saw streams of population flowing into virgin lands whose products now had a market in the East and in Europe, while industry in the East forged rapidly ahead to supply the agricultural markets with goods. With the invention of the steam locomotive, railway development proceeded rapidly after 1830. These two methods of transportation required large amounts of capital for their development. The bonds for the Erie Canal were mostly lodged in London and, with the collapse of South American security prices in London in 1825, British capital turned to the United States where it was placed in productive property supported by state and municipal credit. By 1836 the North alone had invested \$90,000,000 in internal improvements most of which came from foreign sources. Foreign capitalists were content for the most part to take senior securities, leaving the control of American corporations at home.

The purchase of American securities abroad was confined largely to public obligations. American manufacturing and industrial finance were almost entirely domestic matters. The capital market for these industries, transportation, and other enterprises consisted of families of large fortune, a number of insurance companies, large numbers of banks, merchants, and manufacturers.

The period of internal improvements, closing about 1840, saw the development of a substantial capital market for the first time in American history. Unfortunately much capital was wasted in speculation in land and much invested in railroads was unprofitable. State defaults on debts were widespread and banking received a blow through the failure of more than six hundred banks following the panic of 1837. Among these was the Bank of the United States which failed in 1841, wiping out its entire capital of over \$35,000,000. From this time onward private capital sought employment chiefly in railroads but also in canals, banks, and insurance. In the future railroads were financed through brokers, among whom the most famous were Daniel Drew, Jacob Little, and Jay Gould.

One may get a cross-sectional view of American investments in 1854 by reference to a compilation made by the secretary of the treasury ¹

TABLE 2—AMERICAN INVESTMENTS IN 1854

Investment	Total outstanding	Foreign owned
U S Government	\$ 58,205,000	\$ 27,000,000
States	190,718,000	110,972,000
Counties and cities	93,280,000	21,462,000
Railroad bonds	170,112,000	43,889,000
Railroad stocks	309,894,000	8,026,000
Banks and insurance	279,555,000	7,067,000
Canals and navigation	58,019,000	2,522,000
Miscellaneous	18,814,000	1,068,000
Total	\$1,178,597,000	\$222,006,000

From WILLIS and BOGEN, *Investment Banking*, p. 189

The Civil War.—The Civil War greatly stimulated popular investment in the United States. This was due mainly to the efforts of Jay Cooke who was appointed government loan sales agent. Through his efforts over \$2,000,000,000 of bonds were lodged among all classes of people, many of whom received their initial experience in bond buying.

The Period 1865-1900.—The period from 1865 to 1900 was the period of railroad dominance in American finance. Railroads increased their mileage from 35,085 in 1865 to 193,346 in 1900 and capitalization from \$2,664,600,000 in 1871 to \$11,491,000,000 in 1900. During this period the American capital market reached maturity. But the progress during this time was so rapid that the country absorbed an additional \$2,000,000,000 of foreign capital, mostly invested in railroad securities. Industrial corporations were still small and local in character and, with the exception of the Boston copper market, played an unimportant part in American finance.

The Period 1900-1914.—With the turn of the century the country entered a new era of finance. The beginning of this period was marked by new calls for large amounts of capital to finance the major cycle of industrial and railroad consolidations, followed in later years by the rapid development of the public-utility industry. Railroads alone issued \$1,160,000,000 of new securities in the three years from 1900 to 1902, while in only two years industrials with capital of \$10,000,000,000 were formed, most of which, however, represented watered stock. Prior to this in the late eighteen hundred nineties American investors had their first experience with foreign securities. Over \$200,000,000 of capital was invested in securities of English, German, Cuban, Mexican, and Japanese

¹ Report on Foreign Holdings of American Securities

origin Up to this time investments available to the American public were made up of government and municipal bonds, railroad stocks and bonds, the stocks of banks and insurance companies, and real-estate and farm mortgages To these were added during this period large amounts of public-utility and industrial securities which gradually came to play a dominant role in the security markets

Recent American Finance.—The World War and subsequent years gave primacy to the American capital market in world finance The rise in commodity prices and the European demand for goods brought unexampled prosperity to the United States Soon after the outbreak of the war large amounts of American securities held abroad were repatriated In addition, already in 1915 the Anglo-French loan of \$500,000,000 was floated in this country Owing to our own participation in the war and the financing of foreign needs here, the government floated altogether over \$20,000,000,000 of loans, mostly long-time obligations The popularization of the Liberty Loans represented an unexampled feat in the financial experience of the world Whereas we had some 200,000 investors in securities in 1914, in 1919 we had 20,000,000¹ The American public became security minded and, while the holders of government bonds have since declined in number, interest grew in investments in other fields Industrial and utility securities and foreign investment issues came to dominate the market in the decade that followed the war A summary of corporation stocks, bonds, and notes issued in the decade of 1920-1929 shows the enormous accumulation of capital in the United States in recent times

TABLE 3.—SECURITY ISSUES, 1920-1929
(000,000 omitted)

Securities	Railroad	Utility	Industrial	Total
Bonds	\$3,977	\$10,305	\$11,952	\$26,234
Notes	2,059	1,172	3,022	6,253
Stocks	870	6,684	11,287	18,841
Total	\$6,906	\$18,161	\$26,261	\$51,328

Dow-Jones compilation

In addition to these, staggering amounts of municipal and real-estate bonds were floated In the decade from 1922 to 1931 inclusive, municipal and state bond flotations amounted to \$13,559,000,000,² while foreign issues were \$15,170,000,000.

¹ The Government Loan Organization of the Federal Reserve District of New York reported that on Dec 29, 1920, nearly 90 per cent of the federal war debt was in the hands of the public

² Figures derived from data taken from the *Bond Buyer*

Investment Banking.¹—But where many thousands located in diverse parts of the country or world desire to engage their capital in a single enterprise, it becomes necessary to have an agency whose function is to collect the rivulets of capital into large streams which can then be turned into the given enterprise. This function investment bankers perform. Moreover, they possess the necessary experience and equipment to make investigation into the soundness of an undertaking. Industry today conforms to financial standards set up by this class of men through their superior advantages. The public is thus saved many millions of dollars annually through the selective services of this class. They perform a service to the public scarcely realized or appreciated by the investor of today. The reputation of the investment banker more than that of any other class of men is dependent upon the soundness of his judgment. The name of a reputable banking house carries immense weight in the flotation of new securities. The banker's services, moreover, do not end with the flotation of the new issue but extend throughout the life of the investment. The investor is assured that if in the future an emergency should arise in connection with a particular issue the banker stands as sponsor for his interests. These remarks, however, should not be understood to involve any legal responsibility, for his position is that of moral sponsor rather than legal sanction.

Evolution of Investment Banking.—If one looks upon investment banking as a function rather than an institution, one may trace its beginning back to colonial days with the effort to establish mortgage banks. Subsequent to this, commercial banks were in some cases required by law, and in others permitted, to engage in the mortgaging of real estate and farm land. But investment banking as it is known today did not exist in colonial times. As has been seen, the revolution was financed through personal efforts of a few men acting as agents for the government. The financing of the early American corporations was accomplished by opening books for subscriptions at taverns and other public places where subscribers appeared and signed for the amounts desired. Brokers sometimes subscribed in the name of their wealthy customers who could not appear in person and frequently bought securities on their own account to be disposed of later for a commission to their clients.

The program of internal improvements following the War of 1812 was accomplished practically without the aid of underwriters or public offering. State and local bonds were sold in the traditional way by the employment of commissioners or agents of the authorities issuing the bonds. Bids were asked for and domestic merchants, bankers, and foreign houses participated in issues through their successful bidding. American dry-goods houses were especially active in the financing of

¹ The best brief account of the development of investment banking in the United States is found in H. P. Willis and J. I. Bogen, *Investment Banking*, Chap. VII.

foreign trade. Large amounts of domestically floated securities were gathered up by these houses and shipped abroad in payment for imports.

Following the expiration of the charter of the Second Bank of the United States in 1836, this institution reorganized as the Bank of the United States with a Pennsylvania charter and immediately entered actively in the exercise of investment-banking functions. It established an agency in London where it disposed of large issues obtained through successful bids. This bank became the chief channel of foreign investment in the United States until its utter collapse in 1841 when public defaults became numerous. Other houses of prominence in international finance of the time were Morgan, Grenfell and Company, established in London by George Peabody, a wealthy American dry-goods merchant, the Rothschilds through August Belmont as agent in this country, and the French house of Hottinguer which was closely associated with the Bank of the United States. These together with personal agents and commissioners representing the states and municipalities constituted the investment-banking machinery of the time. During this period also in the West and South real-estate mortgage institutions with an eastern clientele developed. The first of these appears to have been established by Francis B. Peabody in 1835 in Illinois.

In the period following the panic of 1837 and continuing down to the time of the Civil War, a number of brokerage houses engaged actively in the purchase and sale of railroad securities. Daniel Drew with his ill-famed connection with the Erie Railroad was the outstanding example. The Mexican War was financed through the house of E. W. Clark and Company of Philadelphia. This firm and others played a leading role in promoting railroads and in reorganizing bankrupt railroads and canals. After the recovery from the panic, international banking houses again rose to prominence under the leadership of August Belmont and Company.

Rise of the Bond House.—The American bond house as it is known today was a direct outgrowth of the practice of underwriting securities. Corporations desiring to raise funds often sold directly to the public and, in order to remove the uncertainty of sale, secured the services of the investment banker who underwrote the issue. The unsold portion of the issue, if there was any, was then purchased according to agreement by the underwriters. This later developed into the practice of outright purchase of entire issues by the bankers themselves, which is the most characteristic feature of the American bond house today.

The Civil War was financed by Jay Cooke of Philadelphia. This personality wrought permanent changes in the marketing of securities in the United States. He employed more than 5,000 salesmen and conducted newspaper and advertising campaigns for the sale of government

bonds for the first time in investment-banking history. His salesmen reached every city and town and country side, distributing posters and circulars in public and private places much like the circus man advertising his show. But the investment market built up to finance the war was not permanent. Public investors as they are known today were at best comparatively few in number and their numbers diminished with the decade following the war. After the war Cooke and other leading houses turned to railroad financing. For a decade they were the chief financiers for our expanding railroads and borrowing municipalities and continued the methods employed in the flotation of government loans. The panic of 1873 and the collapse of the Northern Pacific brought ruin to the house of Cooke. Other houses such as Fisk and Hatch failed for much the same cause and these calamities marked the temporary decline of the distributing houses.

International Banking Houses.—The rise of international banking houses headed by August Belmont had its beginning in the flotation of government loans in connection with the resumption of specie payments in 1879. From this time forward these bankers occupied the position of preeminence in American investment banking. The international bankers were also called upon by the government to secure funds for the maintenance of the gold standard in the currency difficulties of the early eighteen hundred nineties, this added much to their prestige. These houses were chiefly responsible for the financing of the great consolidations of railroads and industrial corporations at the turn of the century. Controlling interest was acquired in certain great railroad systems and industrial corporations by Harriman and Morgan. Promotion was the order of the day and the gross stockwatering of the period is now a matter of general knowledge. In the decade of the eighteen hundred eighties several eastern banking houses were established for the purpose of selling high-yielding western mortgage and municipal bonds, which on the whole followed the methods established by Jay Cooke. The house of Harris, Forbes and Company had its origin in this way.

The methods used by investment bankers of this period were subject to public investigation and regulation. They gave rise to the Hughes insurance investigation in New York and the severing of insurance activity from investment banking. There also arose a demand for the regulation of securities offered to the public by fraudulent dealers which found expression in the blue-sky laws initiated by Kansas in 1911 and anti-fraud statutes of New York, New Jersey, and other states.

After the World War investment bankers took advantage of the increased public participation in government loans to sell securities of every description from the best to the worst. The vast amount of new securities issued since the war proved to be a golden opportunity for investment banking. This period witnessed a change in investment

banking, in that the large distributing house had advanced to take advantage of the newly created market for securities. These houses themselves have become houses of issue as well as distributing houses. But with this change in the investment market came increased expenses in handling an issue and the spread between the price to the corporation and the price to the buyer increased. Many commercial banks and trust companies have entered into investment operations in competition with investment banks and have through this and other measures become "department-store" institutions. Other commercial banks have established close affiliates in the investment-banking field. More recently, however, there has been a reversion among some of these institutions to the specialized function—a change that will be welcomed by the general public.

These years have also seen the rise of common stocks to a position of prominence among both individual and institutional investors. The improved position and stability of the larger corporations appealed to this new market which has been fostered by a change in emphasis between stocks and bonds. Many have become convinced that stocks as long-term investment are superior to bonds. Many investment houses that formerly sold only bonds now indulge freely in stock sales to their clients. The investment banker has thus become a merchant in securities of varied quality instead of the traditional high-grade security merchant. The investment banker has gained, too, at the expense of the commercial banker, in that business concerns have learned the dangers of short-time loans for permanent working-capital purposes. The traditional method of financing these needs has largely given place to financing through long-term issues. Through the large cash surpluses that have become common, well-managed concerns themselves have entered both the investment market and the call market with surplus money and introduced a new factor in security price movements.

Lastly might be mentioned the appearance of investment trusts in the field of investment banking. These constituted a mushroom growth in the years of the stock market boom. They attempted to substitute their management for that of the owners of investment funds. In the crisis of 1930-1931 many of these fell as straws before the reaper. Some of sound organization and management remain and will doubtless find a permanent place in the field of investment management.

Evolution of Exchanges.—Out of the general welter of modern markets may be distinguished two broad types, namely, commodity markets and markets which deal only in intangible titles. The former are represented by produce and commodity exchanges, livestock markets, and grain exchanges, the second type is represented by stock and bond exchanges, over-the-counter security transactions, banking houses for short-time loans, commercial-paper houses, and the like.

In speaking of the origin of markets, Powell says,

The origin of the money market (including in that term both banks and stock exchange) must be looked for in the assemblies at cross-roads, and in churches and churchyards, at the monastery gates, and in the synagogue. The ancient market and the modern stock exchange are both of them simply convenient and prearranged meeting-places, where men foregather for the purpose of trafficking with one another, to gossip, to buy and sell produce, and to adjust bargains generally.¹

The earliest English markets were presumably occupied by traders and merchants dealing in both commodities and intangible titles. Such markets were possibly found even in Norman times. But not until Tudor days (beginning 1485) was there a government in England strong enough to encourage commerce and finance on a national and international scale. About the beginning of the sixteenth century already it was the custom of merchants to meet twice a day in Lombard Street for business transactions. Hence came foreign capitalists now protected by a stable government who became the early representatives of foreign banking houses in England.

But the first definite market of a national or international character was carried on in the Bourse erected by Gresham for the encouragement of industry and commerce. Queen Elizabeth renamed this in 1571 the Royal Exchange, after which it rapidly became a replica of the continental bourses. It was international in character and cosmopolitan in personnel and dealt in bills of exchange, commodities, talhies, seamen's tickets, lottery tickets, and in shares of stock of some few companies which were just then being promoted. "Practically the whole commercial activity of the Metropolis was centered in the Royal Exchange."²

Specialization, however, already appeared at this early time. The Exchange was in fact an assembly of "walks," or points, where stockbrokers and billbrokers concentrated their business, there were French, Greek, and other walks for foreign business. Not until 1698 did the billbrokers and stockbrokers remove the seat of their activities to Exchange-alley and the coffee houses there. Foreign stocks continued to be bought and sold at the Royal Exchange for many years afterwards. But domestic securities in general were dealt in at the Exchange-alley, the South Sea House, and at the headquarters of the East India and Hudson's Bay companies. The first regular list of prices of shares appeared in 1714 and included the stock of the Bank of England along with the stock of the leading overseas corporations trading under monopoly and charter grants from the crown. Nevertheless, all through the eighteenth century the stock exchange was roundly condemned by rich and poor alike as only a place where speculation and manipulation of

¹ *Op. cit.*, p. 38.

² *Ibid.*, p. 146.

price were engaged in by the brokers to their own advantage. Adam Smith found "no niche for the study of securities, or of the Stock Exchange and its business."

Brokers finally came to concentrate in Jonathan's Coffee House and were referred to as the "club," until in 1773 by resolution of the brokers it was renamed the Stock Exchange and moved into its own quarters in Threadneedle Street. At this stage then there were three markets for securities: the Stock Exchange for securities of domestic corporations, the Royal Exchange for foreign issues, and the Bank of England for government loans. But the time had arrived for transactions in securities to take on a less reproachable aspect. Accordingly the more responsible and conservative brokers gradually united in order to establish acceptable standards for the business as a whole. They erected on a new site in Chapel Court a building for the carrying out of this purpose in 1802. Here gravitated transactions in all classes of securities including bank stock, consols, annuities, foreign bonds, exchequer bills, South Sea stock, and stocks of business corporations, as that form of organization rose to prominence. British and foreign government stocks and bonds were the predominant features. The true function of the stock exchange as a market place for capital was not recognized generally until after the treaty of the Congress of 1815 and during the reconstruction following the Napoleonic wars, when industry and commerce entered upon a new development. With the appearance of railway shares, both domestic and foreign, the stock business entered upon an enormous expansion, the number of brokers increasing from less than a half dozen in 1843 to nearly 1,000 in 1851. The London Stock Exchange continued to grow to its present position as the world's largest security market.

The New York Stock Exchange.—The first impetus to trading in securities through brokers developed in Philadelphia and New York in connection with Hamilton's scheme for funding the public debts and the establishment of the First Bank of the United States. In New York the meeting place was in the produce and merchandise auctions at the foot of Wall Street. So great was the interest in government loans and stock of the First Bank of the United States that about 10 auctioneers and merchants specialized in securities, acting in the capacity of brokers for the buyers and sellers. Their meeting place was under an old buttonwood tree in the vicinity of the produce market. In 1792, 24 brokers signed a compact of mutual preference in their dealings and agreed to a uniform commission of one-fourth of 1 per cent of the selling price of securities. This was the first definite step in the independent organization of brokers for the carrying on of security trading.¹

In 1800 the first stock exchange in the United States was formally organized in Philadelphia which was the leading city in finance down to

¹ WILLIS and BOGEN, *op cit*, p. 155

the War of 1812 After the war New York gradually rose to first place The New York Stock Exchange was organized under a written constitution in 1817, although as early as 1801 the informal organization listed four different government issues, three bank stocks, and three insurance stocks ¹

Following the War of 1812 the call money market developed along with the rise of the exchange In 1830 the first railroad stock, the Mohawk and Hudson, was listed The rapid development of railroads following the panic of 1837 brought many of these issues to the New York exchange In 1848 the number of brokers was 112 and the average daily turnover of shares was 5,000 ² The New York exchange had advanced to undisputed leadership in American financial markets Regulations affecting delivery of stock gradually improved from the early days when delivery required 60 days until 1857 when daily settlements were adopted On a single day in 1857, it was claimed 70,000 shares changed hands

After the Civil War the exchange developed into a distinct speculative market owing to the prominence of speculative railroad securities It was in 1867 that the first electric ticker service was introduced In 1869 the New York exchange united with several rivals that had recently sprung up to form the present organization It had 1,060 members under the new arrangement (increased to 1,100 in 1879 where it remained until 1929 when total membership was expanded to 1,375 through a 25 per cent membership dividend) and the amount of listed securities exceeded \$3,000,000,000 ³ The advance of speculation is revealed in the increase in average annual sales from 51,244,048 in the period of 1875-1879 to 104,888,480 in the speculative period 1880-1884 ⁴ Average sales thereafter declined but did not again reach the former volume until about 1900

Speculation on the exchange first reached large proportions with the great speculative cycle at the beginning of the new century which developed in connection with the movement toward railroad and industrial consolidations The first permanent rise in the price of railroad and industrial stocks took place in the decade ending with the panic of 1907 The climax of speculation was reached in 1906 when 283,707,955 shares of stock changed hands From this year of peak activity volume gradually subsided to 47,899,593 in 1914

In 1885 the exchange created an unlisted department for transactions in industrial securities which were too risky to be admitted to regular listing This department was not finally abolished until 1910, the industrial issues gradually being admitted to the regular list in the meantime From that time onward industrial securities gained in importance, while

¹ SERENO S. PRATT, *The Work of Wall Street*, p. 6.

² WILLIS and BOGEN, *op. cit.*, p. 168.

³ PRATT, *op. cit.*, p. 52

⁴ WILLIS and BOGEN, *op. cit.*, p. 177.

railroad stocks declined. After the war the former accounted for about three-fourths of the total transactions, whereas before the war railroads accounted for about an equal proportion. More recently utility securities have risen to prominence.

The events preceding the war in 1914 started a wave of liquidation of securities from Europe and prices melted away so rapidly that the exchange closed for the second time in its history on July 31 and was not opened again until December 15.

Since the war many improvements for convenience of carrying out transactions have been made. The ticker service has been extended to the Pacific Coast and intermediate points and to the South and Southwest. The exchange greatly expanded its educational and publicity work and developed its stock clearing corporation. A day's transactions on the exchange in 1930 required from 500 to 800 members, 500 pages, 235 reporters, and 360 clerks.¹

Listings.—In the *New York Stock Exchange Bulletin* for February, 1932, appeared for the first time a list of stocks and bonds on the exchange for each year since 1865. In that year bond issues numbered 174 and stock issues 136. Since then bond issues have increased steadily, while stock issues increased only moderately until 1909 when they took a decided upward trend which was maintained until 1930. Progress by decades was as follows.

Year (Jan 1)	Stock issues	Bond issues	Year (Jan 1)	Stock issues	Bond issues
1870	143	200	1910	426	1,013
1880	219	408	1920	691	1,114
1890	354	742	1930	1,293	1,543
1900	377	839	1932	1,278	1,601

The value of listed and unlisted stocks and bonds on the exchange in 1902 was \$15,019,085,962. By October, 1911, total listings increased to \$24,374,081,323. On January 1, 1929, the total market value of listed stocks amounted to \$67,478,138,151, while that for bonds was \$47,379,028,502. A more detailed statement of listings February 1, 1932, is shown in Table 4.

Other Exchanges.—This account has been confined largely to the history of the New York Stock Exchange. But exchanges have long existed in other leading cities of the United States and their history is similar to that of the predominant institution. Altogether there are now over twenty exchanges in the United States. The Philadelphia, Boston, Chicago, and San Francisco exchanges have risen to positions of

¹ J. E. MEEKER, *The Work of the Stock Exchange*, rev. ed., p. 79.

importance in our national security markets. There has been observable within recent years a tendency to list the stocks and bonds of corporations with stock holders widely scattered on several exchanges for the expedition of transfers. This decentralization is likely to continue as the financial markets of the larger cities grow in importance. Likewise securities of local interest are likely to remain on the local exchanges.

TABLE 4—LISTINGS ON THE NEW YORK STOCK EXCHANGE, FEBRUARY 1, 1932

Type	Stocks		Bonds		Total	
	Number of issues	Market value, millions	Number of issues	Market value, millions	Number of issues	Market value, millions
Industrials	995	\$16,614	282	\$10,392	1,277	\$27,006
Railroads	164	3,030	679	10,828	843	13,858
Utilities	116	6,732	201	3,736	317	10,468
All civil and foreign			433	27,285	433	27,285
Total	1,275	\$26,377	1,595	\$52,241	2,870	\$78,617

Data from *New York Stock Exchange Bulletin*, February, 1932

Special mention should here be made of the New York Curb Exchange. This institution stands in the position of a junior organization to the "big board" itself. While many securities of the highest quality have for a number of reasons remained on the Curb Exchange, nevertheless it furnishes a market, for the most part, for securities of an unseasoned nature. It also furnishes an initial market for the issues of legitimate promotions which have not yet become widely enough distributed to insure a broad market. As a result of the general character of the issues on the curb, listing standards are not so rigid as on the larger institution. Requirements for publicity of corporate affairs in particular are materially less rigid.

Economic Functions of the Stock Exchange.—The important functions and advantages of stock and bond exchanges will be here only briefly enumerated. The organized markets for securities are similar to organized markets for commodities in the economic functions they perform.

Perhaps the outstanding function of stock exchanges is the creation of a large central market where buyers and sellers, wherever located, find a ready market for their securities. Into the New York Stock Exchange are poured the orders from every nook and corner of the United States and from important centers of world finance. It is in reality a world market for American and foreign securities alike. Its machinery is so highly organized that quotations by wire are almost instantaneously available in the leading cities of the United States and by cable to the

leading centers of Europe. No other market for commodities or securities can compare with the quotation service of this institution. Most of the advantages of stock exchanges usually mentioned flow from the facts of universality of clientele and promptness of quotations.

The New York Stock Exchange in particular has been a powerful force in securing the publicity of corporate affairs. At the time of listing stocks and bonds, elaborate questionnaires are filled out giving information upon the financial affairs of the company concerned. In addition to this, the exchange requires full publicity of annual reports and strongly insists upon regular and prompt quarterly reports. The public today largely owes the present state of publicity in finance to the efforts of the exchange in this direction. The exchange itself is a storehouse of information on the financial affairs of American business and its files are open to the press and the general public.

The listing requirements have done much toward standardization of issues, so that there is a certain guarantee to the investing public that listed issues conform to high standards. Besides these advantages may be mentioned improvement in the value of securities for collateral loans, elimination of many unworthy issues from public participation, continuous transaction providing an instantaneous market, consensus of opinion as to values, machinery for the transfer of securities free from the suspicion of fraud, and, lastly, the function of collecting capital for new investments in industry through new corporate issues.

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CHAPTER III

THE SUPPLY OF INVESTMENT FUNDS

Income has been emphasized as the *sine qua non* of both social and individual investment. Income is important not only because in itself it is the aim and object of all investment but also because upon income rests largely the economic value and price of modern investment issues. Investment analysis is concerned, therefore, more with income than with any other factor.

Law of Diminishing Returns.—This analysis will lead to the conclusion that the equilibrium of the forces of supply and demand in the employment of capital is attained only through adjustment to income. Looked at from another angle, income represents the reward obtained for the use of capital in industry, while yield represents the price offered for the services of capital. When capital is scarce its productiveness is great, and as it becomes more abundant the law of diminishing returns operates to reduce the income to capital as well as the yield on investment issues. With larger and larger capital accumulation and its distribution to the various fields of employment the rate of return gradually diminishes for all alike. This normally results from the lessened physical productivity of additional amounts of capital, unless offset by new inventions and processes of greater effectiveness than the older ones, and also from the lessened value of the increased number of the units of goods produced accompanied by a decline of their marginal utility. Thus over the general field of industry as capital accumulates and in the absence of proportionate improvements in productivity, capital becomes less and less productive, and income declines.

Supply and Demand.—In view of the operation of the universal law of diminishing returns in the sense in which it has just been explained, the conditions governing the supply of and demand for capital become of first-rate importance in the discussion of the cardinal problems of income, value, price, and yield. It is largely through the operation of the law of supply and demand that a given income is obtained and thus ultimately determines the social value of capital. The low productivity of capital in older countries and regions and its high productivity in the newer ones attest to the effectiveness of the forces of supply and demand. One may also observe certain industries which have been too generously supplied with capital with the result that they have become quite unprofitable. Continued investment in these fields merely courts complete

disaster. On the other hand, many new industries return a high percentage on the capital employed largely because of its scarcity relative to the demand for its products. The former case is illustrated at the present time by the agricultural industry in general, the copper industry, the rubber industry, and so forth, and the latter by the chemical industry, electrical industry, the chain store, and so forth.

The importance of the forces of supply and demand naturally suggests this approach to the fundamental problems of investment. This approach will also be found to be the most profitable when attempting to forecast future movements of security prices.

Development of Capital in the United States.—There was practically no accumulation of capital in the United States in colonial days. The revolution was financed mostly by well-to-do colonial families supplemented by considerable amounts of capital from abroad. But the revolution created a demand for materials for war purposes and led to the accumulation of substantial amounts of capital by the merchant and trading classes. After the war, with the removal of restrictions on trade and manufacturing, accumulation by these classes became substantial. This was evidenced by oversubscription within a few hours for the \$8,000,000 of capital for the First Bank of the United States. With the Napoleonic wars in Europe came a great boom to American foreign trade, affecting chiefly the leading cities of the seaboard. Their capital found employment in ships and expanding trade. But foreign sources continued to be depended upon for large amounts of new funds as, for instance, in the purchase of Louisiana Territory, while the federal debt and large portion of the stock of the First Bank of the United States gravitated to London. But by 1812 most of these foreign holdings had been repatriated or paid off and the bank liquidated. The War of 1812 was financed at home but the funds came mostly from a handful of wealthy men of the time.

The period of internal improvements following the war and ending about 1840 was financed largely from foreign sources. Nevertheless, as the public debt of the federal government was being rapidly paid and the country settled, a substantial domestic capital market was developed for the first time. Domestic accumulations of capital went largely into development of manufacturing and industrial enterprises. In the period of the eighteen hundred thirties the chief sources of funds were the wealthy families of the time, a growing number of insurance and banking companies, and contemporary merchants and manufacturers whose funds went into railroads and financial institutions.¹ Banks in particular bought large amounts of public obligations and loaned even larger amounts to promoters of utilities, canals, and even land companies and others on the security of stocks and bonds. The mushroom growth of banks in the eighteen hundred thirties flourished largely through their investment

¹ WILLIS and BOGEN, *op cit*, p. 164.

loans on land and otherwise. This era was especially marked by its widespread and unrestrained speculative activities. After the crash of 1837 laws were enacted in many states restricting the investment operations of banks, followed by other states, while New York forbade buying and selling of stocks entirely except to realize on collateral loans. The call money market was developed in this period and this became a source of funds for speculation on the stock exchange.

Further development of the capital market was not pronounced until the Civil War, when over \$2,000,000,000 was raised from domestic sources for the war. The efforts of Jay Cooke resulted in a permanent addition to the supply of capital from public sources. Nevertheless, after the war the development of industry was so rapid that domestic capital went largely into industrial enterprise where the individual embraced the opportunity of engaging in business for himself and the investment market suffered some reversion.

Before the close of the nineteenth century several distinct sources of capital were evolved in the United States. Aside from the normal accumulations of the general public through industrial activity, Europe supplied us with something like \$2,000,000,000 of new capital, while the federal government paid in interest and principal on the public debt an even larger amount, most of which undoubtedly was reinvested in industry. In addition, savings deposits increased from \$242,600,000 in 1865 to \$2,134,000,000 in 1900, while the assets of life insurance companies reached the sum of \$1,742,000,000 at the end of the century.

At the turn of the century, too, a tremendous uplift took place in all American business and the capital market showed a corresponding expansion. An English authority estimated that the annual accumulation in the United States reached \$450,000,000.¹ Over \$200,000,000 was exported and perhaps a fourth of American securities held abroad was reacquired by 1901. But the unprecedented demand for capital to finance the trust movement and railroad consolidations was so great that foreign sources were again soon drawn upon.

Recent Accumulation of Capital.—Rising prices and prosperity in an era of peace after 1900 gave an enormous stimulus to earnings and accumulation of capital in the United States. This is evidenced in several ways. First, it has been estimated by one writer that the number of stockholders in American corporations advanced from 4,400,000 in 1900 to 7,500,000 in 1913, while the average shares per stockholder decreased from 140 to 87.² Further, savings and time deposits in all banks of the United States reached the sum of \$8,714,000,000 in 1914, while the assets of life insurance companies were \$4,935,000,000 in the same year, having almost trebled since 1900. In spite of this, the

¹ WALTER F. FORD, *Contemporary Review*, Vol. 85.

² *Quarterly Journal of Economics*, Vol. 39, p. 28.

country still drew heavily upon foreign sources. The amount of American securities held in foreign countries at the outbreak of the World War was between 4 and 5 billions. Against this amount Americans held foreign securities to the extent of 2.6 billions leaving a net indebtedness of, say, 2 billions.

But the popularization of investment in the United States on a wide scale had to await the flotation of government bonds in connection with the war. The holders of Liberty bonds at the time have been reliably placed at over 20,000,000. The era of good times following the crisis of 1921 gave the greatest impetus to capital accumulation the United States has ever witnessed. Recent investigation indicates that estimates of the diffusion of stockholders have been exaggerated. Professor Daniel Starch, approaching the problem from two independent angles, concludes that at the beginning of 1931 there were probably 10,000,000 stockholders in all American corporations and that about one family in four or five has at least one stockholder in a corporation.¹

The distribution of stock among the public has been especially rapid since 1925. A compilation of the *Wall Street Journal* shows that 530 identical industrial companies increased the number of common stockholders from 961,027 to 2,061,995 between March 31, 1925 and the same time in 1930.² Thirty-four utility holding companies increased the number of common stockholders during the same interval from 558,124 to 1,243,779, while 32 companies showed increase in preferred stockholders from 375,486 to 566,594.³ Fifty-one investment trusts had 227,952 common stockholders on March 31, 1931.⁴ Twenty principal American railways of the United States had 681,881 stockholders at the beginning of 1930.⁵ On March 31, 1930, 81 banks located in the chief cities of the country numbered 354,024 stockholders, while 57, including the largest of the 81, had only 69,139 in 1925.⁶

Contrary to expectation, the depression of 1930-1931 saw a large addition to the number of stockholders in leading American corporations. During these 2 years the number of shareholders in 346 leading corporations increased 41.5 per cent. Of 31 different classes of enterprise represented, not one showed a decrease. The total number of shareholders at the beginning of 1932 was 5,847,651.⁷ This is the strongest kind of evidence that the public's confidence in stocks from the long-run

¹ *Financial World*, Mar. 25, 1931.

² Issue of Nov. 1, 1930.

³ *Wall Street Journal*, Oct. 16, 1930.

⁴ *Ibid.*, Oct. 31, 1930.

⁵ *Railway Statistics of the United States*, p. 80, 1929.

⁶ *Wall Street Journal*, Oct. 25, 1930.

⁷ Compilation by R. G. Dun and Company, reported in *Chronicle*, Vol. 134, p.

point of view has in no wise been shaken. This source of capital supply promises to grow more and more in the future.

Total Capital Accumulation.—Although the economic progress of a people may be measured in a general way by the amount of wealth it possesses, a more accurate measure consists in the amount of material goods accumulated through toil and sacrifice. To a large extent land is a gift of nature and is indestructible. In estimating the sacrifices of a people as represented by the accumulation of property, therefore, land must be excluded. If land be deducted, the most reliable estimate of the remaining property values in 1910 shows approximately \$80,000,000,000. The amount of man-made equipment in 1922 was placed at \$231,000,000,000 by the Federal Trade Commission and at \$209,000,000,000 by the Census office.¹ The higher figure resulted from valuation of improvements in streets and public roads and a higher valuation being placed upon public-utility property.

The leading items in the total estimate of the Federal Trade Commission were as follows.

Land		\$122,000,000,000
Improvements on land	\$108,000,000,000	
Movable equipment including livestock and farm equipment	40,000,000,000	
Products and merchandise	36,000,000,000	
Furniture and personal effects including automobiles	42,000,000,000	
Gold and silver	4,000,000,000	
Total man-made equipment		230,000,000,000
Grand total		\$352,000,000,000

Federal Trade Commission, Wealth and Income

National Income and Savings.—Of still more interest than total accumulated wealth is the annual rate of accumulation. Although estimates of national income are somewhat conjectural, there are now approximate figures for individual income prepared by Dr Willford I. King. Based upon independent research and using various methods of approach, a number of statisticians have come to the conclusion that savings constitute about one-seventh of the national income.² A rough approximation of annual savings of individuals may, therefore, be made by merely dividing total income figures by 7. Table 5 shows the total amount and significant items in individual income and savings.

The most striking fact about this set of figures is the advance in income in both current and 1913 dollars from the beginning to the end of the period.

¹ To these figures may be added \$18,000,000,000 for foreign investments.

² These are the conclusions of King, Mitchell, and Ingalls.

TABLE 5—REALIZED INDIVIDUAL INCOME AND SAVINGS IN THE UNITED STATES IN CURRENT DOLLARS
(Annual average for period, 000,000 omitted)

Source	1909-1913	1914-1918	1919-1923	1924-1928
Total income	\$32,500	\$45,500	\$68,500	\$84,400
Total income (1913 dollars)	33,400	33,400	39,600	50,500
Entrepreneurs and property owners	15,600	21,800	29,800	35,700
Wages	11,400	15,800	25,800	31,500
Salaries	4,900	7,400	12,000	16,000
Savings (one-seventh of income)	4,643	6,500	9,785	12,057
Corporate savings	1,140	3,560	2,060	2,630

Based on W I King, *The National Income and Its Purchasing Power*

Next may be noticed the decline in the proportion of the income of *entrepreneurs* and property owners from 48 per cent at the beginning to 42.4 per cent at the end of the period. Ground was lost by this class in favor of the wage-earning class to a moderate degree but a substantial gain was made by the salaried class, which advanced from 15.1 to 18.9 per cent. Sources of individual income in percentage are indicated by the following figures:

TABLE 6—SOURCES OF INDIVIDUAL INCOME IN THE UNITED STATES
(In percentage)

Source	1909	1920	1925
Agriculture	16.8	14.9	11.0
Manufacturing	18.5	26.3	20.5
Mercantile	12.4	11.7	14.6
Government	5.2	7.1	7.4
Unclassified	19.3	13.1	20.0
Transportation	8.6	9.7	8.2
All others	9.6	6.6	8.1
Total	100.0	100.0	100.0

Based on King, *op cit*

These figures show the decline in the relative importance of agriculture and the increasing importance of manufacturing and mercantile occupations. The largest gain was made by government employees.

The distribution of corporations to their stockholders and bondholders is shown in Table 7.

The preponderance of common-stock dividends is noted throughout the period but is specially pronounced in recent years. The increase in interest paid on corporate debts within the past decade is striking. All classes of corporations alike participated in this latter movement through

TABLE 7—DISTRIBUTIONS OF CORPORATE DIVIDENDS AND INTEREST PAID TO INDIVIDUALS¹
(000,000 omitted)

Source	1909	1917	1928 ²
Common stock	1,119	3,016	4,760
Preferred stock	451	758	1,171
Interest paid	993	1,255	2,051

¹ From W I King, *op cit*

² Preliminary estimates

increase in indebtedness The increase in dividends on common stocks was due largely to the advance in the amount of stock of factories, mines and oil companies.

Further light may be obtained upon the sources of savings among individuals themselves from statistics gathered in connection with the federal income-tax administration Figures for significant years are given below

TABLE 8—DISTRIBUTION OF NATIONAL INCOME BY FUNCTION
(In percentage of total)

Source	1917	1922	1929
Wages and salaries	22 17	55 06	37 40
Business and partnerships	30 15	17 16	17 47
Profits from sale of real estate and securities	2 63	2 98	7 81
Rents and royalties	5 67	4 92	4 29
Dividends on stocks	23 58	10 71	15 98
Interest	7 76	6 99	7 38

Compiled from *Statistics of Income*

The upward trend of wages and salaries and the downward trend of business profits and dividends are most significant One may also discover from the same source the advance of the man of moderate means over the richer classes In 1916 those with income of \$20,000 and under received only 20 7 per cent of all dividends reported, while in 1929 those with incomes of \$25,000 and less received 41 0 per cent of all dividends reported. This same class in the latter year received 70 per cent of all interest reported

Further light is thrown on the sources of investment funds by Dr. King who estimates that "employees save about 5 per cent of their annual wages and salaries, farmers, together with owners of farm lands and mortgages, save about 12 per cent of their net income from agriculture, other business men save about 33 per cent of their annual incomes" Of the total savings in the period 1909-1918, 20 per cent is

attributed to employees, 12 per cent to agricultural interests, and 68 per cent to business men and property owners exclusive of agriculture Dr King also concludes that "the volume of saving by business concerns varies directly with the waves of business activity," but that "the extent of private savings is much less closely correlated with the economic cycle"¹

Business Savings—The second largest source of supply of capital funds is the earnings of corporations and other forms of business organization From the earliest times down to the present, the characteristic feature of American enterprise has been the expansion of the business unit It has become traditional that a business cannot stand still, it must either move forward or backward Success has accordingly been conditioned upon expansion It early became the custom, therefore, to set aside a certain portion of the annual earnings of the business to take care of increasing trade and develop new plant capacity. American business has thus grown from within, supplying for the most part the funds needed to keep pace with new requirements Whether one is thinking of railway, public-utility, or industrial corporations, the fact is impressed upon one's mind that in the beginning the common stocks of all of these corporations were in the great majority of cases nothing but "water" Not only has an equity equal to every dollar of capitalization been built up back of these stocks, considered as classes, but most corporations show substantial surpluses besides

Business enterprises in their entirety are credited with making 40 per cent of the total annual savings of the country This amount never reaches the stockholder but is impounded as a business surplus The savings of corporations are shown in Table 5 About 60 per cent of the total is attributed to factories and 17 per cent to railroads, while mines, quarries, and oil wells show a deficit In the pre-war years 1909-1912 corporations on the average saved about 38 per cent of their net earnings, and in the period 1923-1926 about 41 per cent² The accumulated surplus and undivided profits of all corporations in the United States at the end of 1929 amounted to \$60,699,000,000 which was two-thirds of the stated value of the common stock. Of this amount, manufacturing enterprises accounted for \$21,016,000,000, transportation and other public utilities for \$11,769,000,000, all classes of financial concerns (including banks) for \$16,238,000,000, and trade for \$4,884,000,000³

Commercial Banks.—At the close of 1917 an authority of high standing estimated that the banking interests of the nation had outstanding loans of approximately \$10,000,000,000 with stocks and bonds alone as collateral The same author estimated the amount of stocks

¹ W C MITCHELL, *Business Cycles, the Problem and Its Setting*, pp 151-157

² KING, *op cit*, pp 278-285

³ *Statistics of Income*, 1929, p 333

and bonds owned outright at \$8,500,000,000 Altogether it appears that the banks in 1917 were carrying paper representing approximately \$18,500,000,000 of investment funds based on stocks and bonds

The *Annual Report of the Comptroller of the Currency* for 1921 shows that the commercial banking institutions of the United States, taken together, owned outright \$8,416,000,000 of stocks and bonds and \$1,061,000,000 of real estate They had, also, loans secured by collateral, probably almost entirely stocks and bonds, amounting to \$5,937,000,000 and loans secured by real estate amounting to \$2,266,000,000 The total amount of funds tied up in paper or securities representing permanent investments was, therefore, \$17,680,000,000. This exceeded the amount loaned for purposes of supplying working capital which amounted to \$17,230,000,000. Loan and trust companies showed investments and loans on permanent assets more than twice the amount of other loans and discounts and 53 per cent of their total assets All institutions together showed that funds employed for investment purposes amounted to 42 per cent of the total resources

Figures were more than doubled in the 10 years following The comptroller of the currency reports as of June 30, 1931, total investments of all commercial banks in the United States of \$15,220,000,000, loans with stocks and bonds as collateral of \$9,045,000,000, and loans secured by liens on real estate of \$4,315,000,000, altogether comprising a grand total of \$28,570,000,000 This amounted to approximately 50 per cent of total resources of \$57,697,000,000 of all commercial banks It appears that banks are more and more becoming agents for the investment of long-time funds and that this characteristic has come to be one of commanding importance

It is sometimes said that commercial banking institutions are only financial middlemen and that their funds are furnished by the public as depositors It must be briefly pointed out, however, that commercial banks are in reality manufacturers of credit and that the amount of credit they are able to supply is determined in the last analysis by the amount of reserves available, their legal regulation, and the state of public confidence The process of manufacturing bank credit was explained in the following words of the Right Hon R. McKenna, Chancellor of the Exchequer of the United Kingdom, before the general meeting of the shareholders of the London Joint City and Midland Bank, Limited, January 29, 1920:

When a bank makes a loan to a customer or allows him an overdraft, in the ordinary course the loan will be drawn upon, or the overdraft will be made, by a check upon the bank drawn by the customer and paid into someone's credit at the same or another bank. The drawer of the check will not have reduced any deposit already in existence because we are supposing a case in which he has been given or allowed an overdraft The receiver of the check, however, when he

pays it into his own account, will be credited with its value, and thereby a new deposit will be created. The only case when a bank loan does not lead to a new deposit is when the check drawn against the loan is used by the receiver to pay off a loan which he himself had at his own bank. In the same way, when a bank buys or discounts a bill, the proceeds of the sale are paid into the credit of the seller's account and increase the total of bank deposits, and in the same way, also, when a bank buys war loans or makes any other investment, the purchase money goes to the credit of somebody's account in some bank and increases the total of deposits.¹

Savings Banks.—Within recent years savings banks have come to occupy an important position in the investment of funds. Total investments of stock and mutual savings banks as of June 30, 1931, amounted to \$4,840,000,000, loans on stocks and bonds to \$67,000,000, and loans on real estate to \$4,315,000,000, altogether comprising a total of \$9,222,000,000. Savings deposits are in reality simply collections of private savings and the banks perform only functions of collection and investment. Thus the question concerning the origin of bank credit does not arise in this case as in the case of commercial banks. The continued popularity of the institutions will undoubtedly assure a more and more important role in the total supply of investment funds in the future.

In this connection should be mentioned also the postal savings system of the United States. On February 1, 1932, this system had \$658,081,034 deposits owned by more than 1,000,000 depositors.

Insurance Companies.—Insurance companies are responsible for a considerable proportion of the aggregate investments in the United States and their importance tends to increase. Figures of growth in the number of policyholders as well as the total assets for these companies show astounding progress. The growth in assets is brought about through the payment of premiums by policyholders and in the accumulations of interest and dividends on investments. Formerly insurance funds were mostly invested in real-estate and farm mortgages, but in recent years bonds and stocks have constituted the larger portion of the total. Real-estate mortgages, bonds, and stocks together account for something like three-fourths of all life insurance investments.

The extent of the growth of the public stake in life insurance is shown by the rapidity of the increase in number of ordinary policyholders (omitting industrial insurance policies) since 1900. In that year there were only 3,186,000 policies in force. At the close of the war they had increased to 12,768,000, which number has since then more than doubled, standing at 29,151,000 at the end of 1928. Total admitted assets increased from \$1,742,000,000 in 1900, to \$5,907,000,000 in 1918, and to \$15,961,000,000 in 1928. In addition to life insurance companies,

¹ Published in *Federal Reserve Bulletin*, March, 1920, p. 248.

fire, marine, and casualty companies showed total admitted assets of \$5,722,000,000

Building and Loan Associations.—In addition to the financial concerns above considered may be mentioned building and loan associations which have become of universal interest. These associations, like banks and insurance companies, act as intermediaries for the investment of large sums of the public's money. Their growth has been even more remarkable than that of insurance companies. In 1900 they had a membership of only 1,495,000 and assets of \$614,000,000. At the close of the war these figures had increased to 4,011,000 and \$1,898,000,000, respectively. Subsequently the increase has been little short of phenomenal, they had 12,111,000 members and assets of \$8,695,000,000 at the close of 1929.

Farm Loan System.—The catalogue of sources of supply of funds may be completed by calling attention to the loans of Federal Land Banks and Joint Stock Land Banks which together totaled \$1,823,000,000 at the end of 1929. These institutions supplement the activities of banks and insurance companies in supplying farmers with long-time capital.

Political Stability and Savings.—The great accumulation of capital in modern industrial nations has been accompanied by political stability. It may be laid down as a primary principle that the first condition favorable for the accumulation of capital is a stable government possessing sufficient power to guarantee the protection of property rights. It is useless to accumulate anything if it cannot be protected from the deadly hand of the brigand, the thief, or the robber. It must be plain to all observers that countries having weak governments are woefully backward in their economic development, while, on the other hand, countries possessing strong governments show the greatest industrial advancement. Stability of government, industrial advancement, and civilization itself go hand in hand.

Sound Currency.—A second important factor in the accumulation of capital is a sound system of currency. Money is the yardstick by which are measured the productive powers of men. It makes possible a highly organized economic system with its extended division of labor and specialization of effort. As long as this measure remains comparatively unaltered, the factors of production work harmoniously together. But once let it become unstable, it gives rise to dissensions and disputes which halt the entire machinery of production. It is a duty incumbent upon all governments to see to it that its currency remains sound. Inflationary policies of governments rob the laborer of his just wage, discourage the capitalist, and undermine the basis of all industry. The belligerent nations, in the recent war, which have allowed their currency to drift to run show the least recovery made from the effects of the war. Foreign capital enters these countries but sparingly, or not at all. On the other

hand, those countries which still possess a currency which is sound, although the basis may have been altered, are rapidly recovering to normalcy. An unsound currency shows itself in the unceasing stream of paper coming from the printing press until its value sinks to zero. Before this stage is reached, however, it is rejected by the public, and industrial life is found to revert to the barter stage if foreign currencies are not available.

It is generally recognized that a sound currency system is one that has an adequate metallic basis. In former times both gold and silver served this purpose but, since the greater abundance of silver has reduced its value, gold has been almost universally adopted. Gold is necessary for a sound currency system because it protects paper money and bank credit through the privilege of converting these means of exchange into a metal of commercial value. The general acceptability of gold has made it the most universally employed. The first essential then to a sound currency system is the retention of a metallic basis with the continuous opportunity of conversion of all kinds of money into this metal. There is no other basis of value than the usefulness of a commodity to society. In this respect gold and silver are in the same position as other commodities and without such usefulness confidence in a money system would be wanting.

To those who have their doubts as to this function of gold and silver in a monetary system, another function may have greater appeal. Regardless of intrinsic value of these metals, if the currency system, involving all forms of credit money and bank credit, be anchored to these metals as a base, there is the most effective guarantee against inflation. The world's experience with gold and silver as monetary bases prove amply, however, that they are no guarantee against fluctuations of commodities prices. Nevertheless, such fluctuations are necessarily confined within very definite limits. Inflationary processes in the past have always been brought about through increases in the conditions affecting the basic reserves of the monetary system. This may be through increases in the supply of gold, or it may just as effectively be occasioned by changes in reserve laws or practices, or both. But as long as the additional currency is anchored to the metal as a base, the extent of the inflation is limited to the changed situation. Likewise when deflation comes, as in 1930 and 1931, it is occasioned by an effort of the banks to provide a safe basis of gold or reserves against all demands upon it for money. If these demands are too great, banks must close their doors. This happened on a large scale in 1931 when certain European countries, for the want of an adequate metallic basis, had to abandon the gold standard.

The experience of countries lacking an adequate metallic basis shows that inflation is difficult to avoid. This was shown in the experience of

the United States with the greenbacks during and following the Civil War, and the experience in central Europe with paper currencies following the World War. In the first case the government took steps ultimately to return to a metallic basis and inflation was limited by the prospect of this eventuating. But in the case of Central Europe no serious effort was made to avoid excessive inflation by arranging for the ultimate return to a gold basis. The value of these currencies finally approached the vanishing point. Other countries lacking sufficient metal basis to return to the pre-war parity revalorized their currencies by cutting the gold basis to a fraction of what it previously was. France is the notable example of this course.

International Stability.—Perhaps of equal importance with a stable domestic government and sound currency is international or world stability. The material progress of a people is limited by the frequency and severity of wars. This is especially true in respect to those countries whose territory is devastated and whose industries are leveled to the ground. This material destruction, however, is perhaps not the worst economic result of wars. It is exceeded in conquered countries by the impairment of national morale and self-respect. In cases of severe humiliation the recovery of the will to progress is a matter which waits upon the rise of a new generation of business men with a forward look, to whom the past is only history or a memory. Even the victorious participants in exhaustive wars are left economically and financially exhausted, to say nothing of the depletion of industrial manpower. The currencies of the countries affected are usually thrown into chaos with all of the attendant uncertainty in the conduct of business. We need here only recall the decades of economic revulsion in certain countries following the Napoleonic wars, the set-back of the South following the Civil War, and more recently the failure still to repair the economic ruin in the wake of the World War. In a very real sense world economic progress is conditioned upon the maintenance of international peace and the maintenance of liberal trade relations among the nations of the world.

Economic Factors.—Among the economic factors that materially influence saving may first be mentioned the productive capacity of the people. It has been shown that about one-seventh of the annual product of industry is saved and so a change in productive efficiency affects proportionately the amount of savings. The two most variable elements in productive efficiency are management and labor. So important is the managerial element that it is becoming an axiom in matters of finance that the success or failure of an industrial establishment is largely in the hands of the management. The report of the Hoover Committee on the Elimination of Waste in Industry concluded that in the six industries investigated about 84 per cent of the waste was attributable to the management and 16 per cent to labor. Periods of industrial boom are

invariably accompanied by extravagance and laxness of the management. The great trust movement at the end of the last century, as well as the railroad booms of the generation preceding, were accompanied by the wildest extravagance and neglect of productive effort. It seemed that the managers of industry, almost *en masse*, had gone foraging for profits. The same was true of the period following the World War, when "profiteering" became the rule and productive effort gave place to rank speculation.

In its summary of the causes of waste, the Hoover Committee found four of outstanding importance.

- 1 Low production, due to bad management in the purchase and utilization of materials and the handling of the plant and labor force,
- 2 Interrupted production, due to strikes, unnecessary closing down of plant, and idle equipment,
- 3 Restricted production, due to the intentional slowing down on the part of labor or management,
- 4 Lost production, due to sickness, accidents, and so forth

However important is the productiveness of industry, the distribution of the product appears, also, to exert a determining force on savings. It has been shown that the classes of largest income, together with corporate and business savings, constitute the chief sources of capital funds. The funds thus provided are obtained from the return to capital and the distributed and undistributed profits of industry. The great mass of laborers save but little. They spend the great bulk of their earnings on living expenses. Any tendency toward an increase in wages is quickly manifested by the evidences of a rising standard of living which absorbs surplus earnings. It may, therefore, be laid down as a principle that the larger the return to capital and the greater the profits of business in proportion to the total product of industry, the larger will be the annual savings of the people. On the contrary, the larger the share that goes to labor, the less will be the amount available for capital and profits, and so the smaller will be the savings of the entire people.

Motives in Saving.—The habit of saving, laying by something for the future, had its beginning in early society. The construction of a boat, a fishing net, or, perhaps, the building of a rudimentary dwelling place, all stand as evidence of the earliest beginnings of the saving habit. Those who thus manifested an elementary form of thrift were the first to set the example of an economic endowment to the other members of the community. As savings grew in amount, pride in the possession of private property added a spiritual incentive to saving, in addition to the materialistic one of providing for the future. Saving could be carried on, however, only to a limited extent as long as the race was nomadic. With the coming of settled life came, also, more or less stability in the form and purpose of government. This gave protection to the property of the community saved by the more frugal members and laid the foundation for

future accumulation The amount of savings, nevertheless, was necessarily limited for centuries by inadequate means of preservation When food, clothing, and living accommodations sufficient for the immediate future were provided and the customary implements for production were at hand, there was little motive for future sacrifice Saving without preservation could indeed be carried on but to no other purpose than an embarrassment of goods for immediate use and a surplus of implements which found no hand to manipulate them

How different is the situation at the present time! Instead of the necessity of searching for means whereby surplus income may be preserved, there is a constant outcry for funds to supply an ever-increasing population with the necessaries and comforts of life Investment funds command a high price, as evidenced by the present high rates of interest This modern condition has been brought about by the inventive application of the mind The beginnings of the industrial revolution are only about one and one-half centuries old, while the application of the main inventions to modern industrial machinery is much younger The accumulation of capital on a really large scale has been possible only from about the middle of the nineteenth century It is the massiveness of modern productive machinery with its constantly growing complexity, the hugeness of power machinery, and the enormously expensive equipment of all kinds which promise almost unlimited employment for investment funds in the future The modern form of business organization, too, has played its part in bridging the gap from the saver to the producer

Saving involves a choice. All who come into the possession of funds more than sufficient for the essential needs of living have the choice of spending or saving the surplus. The exercise of this choice reveals many kinds of individuals actuated by a still greater number of motives Some are more industrious and less extravagant than others Unfortunately, the more extravagant predominate As has already been remarked, the great majority of the people of the United States have saved nothing beyond a modest rainy-day fund Dr Thorndike, an eminent psychologist, after a thorough study of the problem, concludes that man is by nature improvident and predisposed against saving This natural tendency, however, has been overcome by many through "inhibition by rational insight" The greatest need, therefore, among those who do not get beyond the rainy-day fund theory is for education The wider establishment of the savings bank, the postal savings departments, the extension of insurance, the building and loan movement, customer and employee ownership of industry, and the like, are all encouraging signs for the future

While undoubtedly the chief motive which impels the poorer classes to save is for the rainy day, the middle classes have reached a stage beyond this Their immediate wants are provided for. The chief motive

which stirs this class is social ambition and business prestige. The motive of establishing a financial competence for the family, implying therewith all of the privileges and distinctions of education, travel, and culture, is the magnet with unfailing drawing power. Furthermore, wealth brings power to its owner in business, in the community, the church, the club, and so forth. These are among the strongest of human motives and have always stirred the ambitions of men. The desire to rise from the class in which one is born to a higher plane, to place the family a little higher in the social scale than it formerly was, is the more or less normal attitude of mind for the inhabitant of a country like the United States where opportunity is free and the business life honorable.

The well-to-do and rich classes have all of the advantages that wealth brings. At the same time they are responsible for the greater portion of the savings of the country. They are actuated of necessity by different motives than those already noticed. They desire above all things to accumulate wealth for the power and influence it gives them. They wish to attain their place in the sun in the business world. As expressed by Dr. A. S. Dewey, in his *Financial Policy of Corporations*,¹ "The race-old instinct of conquest becomes translated in our twentieth century economic world into the prosaic terms of corporate growth. Business expansion is the spirit of a modern Tamerlane seeking new markets to conquer. It is a pawn for human ambition." While some seek fame and influence through politics, learning, art, and the like, it is given to the business man to exercise his talents in the control of material things. Yet, at bottom, the moving impulse is strikingly the same. The sheer impulse to create something, to conceive a mammoth project and prove its feasibility through constructive activity, is, also, at the root of modern accumulation of wealth. Great captains of industry are like great inventors—their genius is to make something new and have it succeed. Big business appeals to the imagination and, when set in terms of national achievement, takes on the glamour of patriotism. Profits undoubtedly are an essential part of the process, for without the increase of wealth it is impossible to attain the highest positions in the business world. Nevertheless, the spiritual motives easily come first with the captains of industry.

It has been said that saving involves a choice. This is true only within limits. The subtle influence of what for the want of a better name is called the "standard of living" pervades all classes of society. Social standards for the most part set the pace of expenditure. The economic ideals of a people can be read in its standard of living. The lower classes imitate those immediately above them, while the better-to-do classes ape their superiors. Ambition to live a little better than one's neighbors or associates, to outdo others, is responsible among all classes for the

¹ Book IV, p. 5

extravagance of private expenditure Social standing is shown by the kinds of clothes worn, the kind of automobile possessed, the country home or the cottage on the lake or seashore, the summer home in the mountains or the winter home in Florida The standard of living is, furthermore, largely a competitive one Professor Thorstein Veblen has stated this truth in picturesque language when he says that "potent craving for objective approval shown in vicarious consumption and conspicuous waste"¹ is responsible for much of the extravagance in both private and public life

The needs of the present are greatly overvalued in comparison with the needs of the future. The future is uncertain, and who knows perhaps a windfall will come to each of us Although the chance of such a windfall, of getting something for nothing, is negligible in the mathematical calculation of things, yet it is still a chance, and no matter how slim it may be, people cling to it with tenacity On the other hand, foresight, provision for the future through a more certain process, is still far beyond the economic ideals of the vast majority of the human race.

It may be said, in summary, that the motives which are the determining influence on the amount of savings of the people depend, in the broadest way, upon strength of character, advance in civilization, power of inhibition, and aims and purposes in life—in short, the ideals which govern daily activities With a stable government, sound currency, a disposition to produce at full capacity, suitable investment institutions for the assembling of accumulated funds, and with an eye to the future rather than to the present, economic prosperity would be assured and society would be rid of the millstone of dependency

The Interest Rate, Profits, and Saving.—It is quite generally accepted that the amount of return offered on investments has a profound influence on the amount of the savings of society It appears to the author that this matter has been much overdone The leading considerations which induce saving have just been recited It is quite unreasonable to suppose that the poorer classes who save on the theory of the rainy-day fund will be influenced to any great extent by a shift in the rate of interest from 3 to 4, 5, or 6 per cent or by a drop of similar proportions Likewise, the dominating motives of self-objectification and the attainment of high position by the upper classes vastly outweigh any purely material influence that might be exerted by a change one way or the other in the rate of interest Of this class Professor Taussig says. "Among these no specific rate of return on accumulation plays a dominant part"² It has been shown that this class accounts for the largest percentage of the accumulated wealth of the country

¹ See discussion in Veblen, *Theory of the Leisure Class*, Chap. iv.

² *Principles of Economics*, Vol. II, p. 20'

There remains to be considered the middle class. It is among the people of this class that the rate of interest is supposed to exercise the greatest influence on the choice between saving or spending. It has been shown that the members of this class save largely to provide a competence for the family, to increase social prestige, and for similar purposes. These motives operate independently of the interest rate. Indeed, there is strong reason for believing that the rate of interest would have the opposite effect from that which is usually attributed to it. A 3 per cent rate of interest would necessitate a greater amount of savings to provide a competence than a 6 per cent rate, since the return on the amount of capital accumulated would provide only one-half as much income.

In this connection a neglected aspect of this problem needs to be emphasized. Although it is true that the interest rate has comparatively little influence on the disposition of income received, it should, nevertheless, be appreciated that a higher rate of interest inevitably results in an altered distribution of the income of all the people. A higher interest rate means that a larger share of the total annual income goes to the owners of capital, and, in all probability, more of it is saved than would be the case if labor got a larger share.

Even though the direct influence of the interest rate upon saving is uncertain, it might be otherwise with profits. Profits represent the interests of the proprietors, and in corporation finance the common stockholders are made the residual claimants upon the assets and earnings of the business. They bear the risk, and the rewards are far greater than in the case of the holders of senior-lien securities. The rate of profits of a successful business establishment over a period of years upon the amount of capital actually invested by the stockholders is traditionally many hundred fold and in some cases a thousand fold. The prospect of multiplying many times the original investment appeals powerfully to the imagination of the average man. The Rockefellers, the Carnegies, and the Fords furnish outstanding examples of men who have accumulated fortunes through successful business undertakings. It is the ideal of great achievement that inspires most business men of the younger generation to exert themselves to the utmost and carefully husband the gains from their efforts by "plowing" them back into the business. The possibility of large profits, thus, must be considered a strong influence on the total savings of the country.

There is, also, the vast army of men who hope by a lucky strike or "superior intelligence" to gain financial independence. If the first thousand dollars could be saved and invested in a mine, an oil well, a rubber plantation, a factory for the exploitation of the latest invention, or, perhaps, in a section of land in a new country hitherto overlooked, the stream of gold might be turned the way of the "astute" investor. But the savings of this class are generally swallowed up in the failure of the schemes, and thus little capital is added from this source.

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CHAPTER IV

THE DEMAND FOR INVESTMENT FUNDS

The demand for fresh capital constitutes the opportunity of the investor to employ his funds to advantage. Under simple economic conditions demand and supply were united in the same person, but with the division of labor came a specialized class of producers who looked to society for funds with which to carry on their operations. Among the varied choices open to him the investor is constantly seeking out the kinds of investments which come nearest to meeting the ends he has in view. Fortunately, the choice of fields in which to employ capital is great and even greater still are the specific types of securities offered and the detailed provisions peculiar to each issue. In fact, the investment banker of today may be likened to a modern dry-goods merchant with his bewildering variety of patterns, so that the modern investor has much to learn concerning the opportunities open to him if he is to employ his funds intelligently. In this and succeeding chapters we are concerned largely with the channels open for the investment of capital and with the rights and privileges attached to the different types of securities from which a choice must be made.

Sources of Demand.—One may get a cross-sectional view of the accumulated demand for capital by a classification of wealth into the leading divisions. But the term wealth includes more than the term capital. Land and natural agents do not represent invested capital, as has already been made clear, and therefore must be excluded from the sources of demand for capital funds. All other wealth represents the present accumulated demand for capital goods and durable equipment of all kinds. Much of this mass of wealth is in the hands of those who saved the funds necessary for its acquisition and hence is only of indirect concern to us. All such property as dwelling houses, automobiles, household furniture, and in fact the entire class of consumption goods which is in the hands of those who are currently receiving its benefits, must also be deducted from the sum total of wealth to arrive at the class of capital goods which is of direct concern to the investing public. Only those kinds of goods which give occasion for investment for money income are the direct object of interest.¹

¹ Consumption goods in the hands of their owners indeed produce what has been called psychic income. But psychic income is not income as understood in the language of finance. It produces no net return but simply yields its utility through gradual consumption.

Accumulated capital, on the other hand, fails to take full account of accumulated savings. We have previously called attention to the fact that something like one-fourth of all savings is lost on account of misdirected investments, fires, floods, and disasters. To this large amount we must also add losses from obsolescence of capital for which no adequate reserves have been set up. Social obsolescence of property is of immense proportions in an age of rapid advance in industrial technique and change in public wants. Moreover, accumulated capital also fails to take account of the enormous demands of federal, state, and local governments for the expenditure of money in unproductive ways. In addition, we may also call attention to the consumption demand for capital of some individuals from others, the utilization of which results in no tangible increase in production. The list will be complete only when one throws in also the amount of capital exported to foreign countries and for which only intangible evidence is at hand. The continuous demand for capital is, therefore, much greater than that indicated merely by the progress of accumulated capital goods.

Evolution of Demand.—At this juncture the outlines of the history of the demand for capital may be briefly rehearsed. One may begin by recalling that in colonial times restrictions on the employment of capital led to the development of trade and shipping as the leading industries of the time. These received additional momentum from the Napoleonic wars, while manufacturing was just receiving its first abiding impetus. Then came the War of 1812 which offered opportunity for safe investment of funds greater in amount than could be supplied in the United States. In the quarter century following the war, the era of internal improvements called for unexampled amounts of fresh funds for the development of the regions to the west of the Alleghany Mountains. At this time, too, the construction of railroads soon began to develop a demand for capital on a large scale. In addition, this was the golden era of the development of American shipping with the clipper as the pride of the merchant marine. Then came the Civil War and with it all previous records for the demand for funds were eclipsed. In the period from the Civil War till the end of the century the construction of transcontinental and other railroads and the development of agriculture gave the characteristic tone to economic progress. Railroads were the key to the agricultural West, which in turn sought a market for its products in the manufacturing East and through the seaboard cities reached the European population.

With the turn of the century the country enters upon a new era of development distinct from that of the preceding period. In this period came the development of manufacturing on a large scale and the consolidation of railroads and industrial enterprises into huge organizations. In this period also the character of much of our manufacturing changed

from necessities to luxuries. This is strikingly illustrated by the manufacture of pleasure automobiles, radios, and musical instruments. Even more characteristic was the development of the telephone, the electric light and power industry, the street railway, the gas industry, and the chemical industry. The unexampled prosperity of this period is usually attributed largely to the advance of commodity prices following new discoveries of gold at the end of the last century. It has not been so commonly appreciated that the development of the new industries gave opportunity for the employment of labor and capital in manifold ways which served constantly to add to the great variety of consumable commodities and thus keep the machinery of production and exchange running. This era stands as an example of the value of invention and initiative in industry. It may also be noticed that the greater variety of products in this period served to stay the effects of the operation of the law of marginal utility and thus added greatly to satisfaction in consumption.

The next chapter in the history of the development of the demand for capital came with the World War. This war dwarfed all previous demands for funds. The belligerent nations of Europe created debts in excess of \$185,000,000,000, while the United States alone raised more than \$25,000,000,000. Much of the latter was disguised demand of the allied governments for war materials.

The characteristic development after the war was the foreign demand for American capital. The accumulated private debts owing to the United States from abroad at the present time exceeds \$18,000,000,000, while more than \$12,000,000,000 is still due the federal government. In the present state of restrictions on international trade and finance, it may be fairly predicted that this movement has passed its zenith.

No one can say at the present time what the next development will be, since this depends partly upon the progress of discovery and invention and the production of goods still unknown. Undoubtedly transportation by air, the natural-gas industry, the radio, as well as the electrical and chemical industries, will come in for their share of the future development and require large investment of capital on the part of the public.

Statistics of Capital Accumulation.—One may visualize the growth of wealth in the United States through estimates made by the federal government (table, top of page 64).

A more detailed statement of the recent growth of national wealth is furnished by the Census Bureau. It shows the advance and predominant importance in 1922 of the items, machinery and tools, railroads and their equipment, manufactured products, and tangible personal property which taken together account for one-third of the total. No attempt is made

TOTAL WEALTH OF THE UNITED STATES

Year	Total (in millions)	Per capita	Year	Total (in millions)	Per capita
1860	\$16,160	\$ 514	1912	\$186,300	\$1,950
1880	43,642	870	1922	320,804	2,918
1900	88,517	1,165			

Statistical Abstract, 1930, p 291

in these figures to separate land from improvements upon land, which together under the heading of real property account for 55 per cent of the total. Buildings and structures of all kinds undoubtedly constitute the most important single item in our national wealth and represent savings of the people.

TABLE 9 —ESTIMATED NATIONAL WEALTH OF THE UNITED STATES
(000,000 omitted)

Source	1900	1912	1922
Real property	\$52,538	\$109,237	\$176,415
Livestock	3,306	6,238	5,807
Farm implements and machinery	750	1,368	2,605
Gold and silver coin and bullion	1,677	2,617	4,278
Manufacturing machinery and tools, etc	2,541	6,091	15,783
Railroads and their equipment	9,036	16,149	19,951
Motor vehicles			4,567
Street railways	1,576	4,597	4,878
Telegraph and telephones	612	1,304	1,950
Shipping and canals	538	1,491	2,951
Electric light and power stations	403	2,099	4,229
Agricultural products	1,455	5,240	5,466
Manufactured products	6,087	14,694	28,423
Furniture, fixtures, clothing, etc	6,880	12,758	39,816
All others	1,079	2,417	3,685
Total	\$88,517	\$186,300	\$320,804

Statistical Abstract, Bureau of the Census, Department of Commerce, 1930, p 291

Intangible Wealth—A more exact picture of the present status of demand is obtained from statistics bearing upon the intangible wealth in the United States. The following table has been compiled from various authentic sources and presents a fair picture of the volume and detail of intangibles outstanding at the present time. Intangibles representing corporate wealth constitute about two-thirds of the total, real-estate and farm mortgages about 15 per cent, public debts about 13 per cent, and foreign investments about $7\frac{1}{2}$ per cent.

TABLE 10—INTANGIBLE WEALTH IN THE UNITED STATES
(000,000 omitted)

Source	Bonded debt and mortgages	Pre- ferred stock	Common stock	Total
I Corporations (Dec 31, 1929) ¹				
Agricultural and related industries	\$ 221	\$ 115	\$ 935	\$ 1,271
Mining and quarrying	1,037	537	5,714	7,288
Manufacturing	5,449	7,008	26,219	38,676
Construction	350	152	731	1,233
Transportation and other public utilities	26,619	5,655	22,475	54,749
Trade	1,252	1,850	7,466	10,568
Service—hotels, amusements	1,562	615	1,902	4,079
Finance—banking, insurance, real estate, brokers, etc	10,135	3,770	24,512	38,417
Others	14	32	161	207
Total for corporations	\$46,639	\$19,734	\$90,115	\$156,488
II Federal debt (June 30, 1931) ²				16,481
III State and local debts ³				16,000
IV Real-estate and farm mortgages (Jan 1, 1932)				36,000
V Private foreign investments (Jan 1, 1932)				18,000
Grand total				\$242,969

¹ *Statistics of Income, 1929, p. 332*² *Secretary of Treasury Report, 1931, p. 502*³ *Bulletin of the National City Bank, Jan. 1, 1932*

Annual Demand for Capital.—The annual demand for capital during the past decade from leading sources, for which information is readily available, is shown in a compilation below from figures supplied by the *Commercial and Financial Chronicle*. These figures show the trend of finance during the past decade as well as the total public offerings for the period. They reveal the comparatively small amount of capital going into railroads annually during the period. On the other hand, utilities and industrials show a pronounced upward trend. Total corporate issues also show a strong trend upward and account for the bulk of all flotations. Foreign issues rise to especial prominence in the years from 1924 to 1928 but drop to small proportions in 1931. Municipal issues maintained their steady increase during the decade and constitute a considerable percentage of the total. The course of bond and note issues follows a parabolic curve. Both preferred and common stocks gain very rapidly from 1922 onward until 1930, when both show a precipitous drop.

Federal Debt.—It has long been a tradition in the United States that public debts should be paid; this has operated to restrain public borrowing

TABLE 11 —NEW CAPITAL ISSUES IN THE UNITED STATES
(000,000 omitted)

Source	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931
Domestic corporations										
Bonds and notes	\$1,644	\$1,975	\$2 190	\$2,451	\$2 666	\$3,182	\$2,384	\$ 2,077	\$2,079	\$1 238
Preferred stocks	292	335	318	594	500	874	1,149	1,516	412	116
Common stocks	277	324	511	558	577	599	1,811	4,417	1,001	195
Farm loan issues	344	337	179	168	91	86	63		86	74
State and municipal	1,113	1,051	1,387	1,300	1,353	1,486	1,385	1,424	1 434	1,223
Foreign	633	279	984	1,084	1,143	1,559	1,318	757	1,006	252
Total	\$4,303	\$4,301	\$5,098	\$6,215	\$6,339	\$7,786	\$8,110	\$10,101	\$7,008	\$3,103
Railroads	\$ 523	\$ 464	\$ 779	\$ 380	\$ 246	\$ 505	\$ 364	\$ 546	\$ 797	\$ 345
Public utilities	726	888	1,325	1,481	1,597	2,065	1,811	1,932	2,365	948
Industrials	1,086	1,350	1,218	2,239	2,414	2,821	3,904	6,171	1,782	470
Total	\$2,335	\$2,702	\$3,322	\$4,100	\$4,257	\$5,391	\$6 079	\$ 8,640	\$4,944	\$1,763

Commercial and Financial Chronicle

more here than in European countries where the opposite theory has generally prevailed. The chief debts incurred by the national governments have resulted from wars. It has always been the policy to liquidate the bulk of these debts as soon as circumstances would permit. During the 25 years following the Civil War, the greater portion of the national debt was redeemed. When the United States entered the war in 1917, the national interest-bearing debt amounted to a round billion dollars. Within the next 2 years this was increased to over \$25,000,000,000. This immense sum created a drain upon the public for funds which were supplied partly by denying industry its part in the savings of the people and partly by currency inflation.

The federal debt outstanding June 30, 1931, was \$16,519,588,640. Of this amount \$776,154,790 originated in the pre-war period. Most of this latter is represented by bonds covering debts of the Civil War and since then has been continuously used as coverage for notes of national banks. A considerable portion represents postal savings' bonds and Panama Canal bonds. Liberty bonds and Treasury bonds amounted to \$12,754,684,000 and originated with the World War.¹ The balance of the debt consists of short-time obligations, notes, certificates of indebtedness, and treasury bills. In all probability the short-term indebtedness will soon be funded into long-term bonds which will call for public subscription. On June 30, 1931, foreign obligations held by the government amounted to \$12,333,717,959.² Exclusive of foreign account the net indebtedness of the federal government at the end of the fiscal year 1931 was less than \$5,000,000,000. The peak of the federal debt was reached

¹ *Annual Report of the Secretary of the Treasury*, 1931, p. 518.² *Ibid.*, p. 117.

in 1919 when it stood at \$25,484,506,160. Since then it has been reduced by \$8,767,000,000.¹ The government has thus been a factor on the supply side of the capital market during the past 12 years.

State and Municipal Indebtedness.—State and local indebtedness has shown an enormous advance since 1902 when it stood at only \$1,864,000,000. By 1913 it had more than doubled, standing at \$3,821,000,000. In the following 7 years it almost doubled again, standing at \$6,261,000,000 in 1921. In the following decade it advanced to about \$16,000,000,000, which was approximately equal to the federal debt at the same time.

The annual increase in state and municipal indebtedness in the decade prior to 1931 was about a billion dollars a year. A tabulation made by the *Commercial and Financial Chronicle* shows that during this period the largest item, accounting for over 25 per cent of the total increase, was for streets, roads, and bridges. Next come schools, averaging about 20 per cent of the total. These are followed by improvements and water each of which accounts for another 10 per cent or more. Sewers, buildings, and parks are important also though less prominent than the others.

The increase in state and local indebtedness may be explained on several grounds. First may be mentioned the higher prices following the war which greatly increased all money values and hence distort the perspective of pre-war days. But the high prices in the post-war period have now been largely erased and the debts contracted upon these prices become more and more burdensome, since interest and principal now have to be paid in dollars which are equal in value to 1913 dollars.

A second factor in the increase in debts is high taxation by the federal government whose running expenses have remained at huge figures compared with pre-war days, while the interest on the public debts itself adds considerable to the burden. Hardly any other recourse was open to the states and localities in their program of expenditure but that of borrowing. Expenditures have increased largely through the general tendency toward social consumption, through schools, roads, recreation, and the like, and the higher plane in general upon which the population has lived since the war. The burden of these debts and expenditures was especially great during the depression of 1930-1931 when strong demand was manifested for retrenchment.

Nevertheless, the purposes for which these debts have been created are for the most part good. They are highly desirable in the main if only they do not remain too great a financial burden to carry. Perhaps the severest criticism that can be leveled against them is that too ambitious programs have been undertaken and the balance between public and private expenditures has been upset. It is more than probable, too, that economies in expenditure of funds would have held the figures down materially from their present height.

¹ *Ibid.*, p. 537.

Foreign Investments.—The foreign demand for American capital averaged over \$1,000,000,000 annually in the period from 1924 to 1931. This demand came in about equal proportions from governmental units and from corporations, in both cases bonds being used for the most part. A large portion of all foreign indebtedness to the United States consists of short-term obligations owing to American bankers, business concerns, and private investors. The short-term loans were to a large extent the cause of the breakdown of international credit in 1931.

The distribution of foreign private long-term investments at the end of 1930 shows that Europe (mostly Germany, France, and Great Britain) was responsible for almost \$5,000,000,000 of the total, while Canada had almost \$4,000,000,000, and South America over \$3,000,000,000. The summary of the Department of Commerce is worthy of perusal.

TABLE 12.—PRIVATE LONG-TERM AMERICAN INVESTMENTS ABROAD AT THE END OF 1931
(000,000 omitted)

Location	Direct	Portfolio	Total
Canada	\$2,048	\$1,892	\$ 3,940
Europe	1,468	3,460	4,928
Mexico and Central America	930	37	967
South America	1,631	1,410	3,041
West Indies	1,072	161	1,233
Africa	115	2	117
Asia	419	603	1,022
Oceania	154	264	418
Total	\$7,837	\$7,829	\$15,666

A New Estimate of American Investments Abroad, *Trade Information Bulletin* 767, U. S. Department of Commerce

Consumption Demand for Capital.—First the demand for funds for consumption purposes from individuals may be briefly discussed. This demand for capital involves two sources, namely, that supplied by those who desire to use it and that obtained from others who have a surplus on their hands. One may convert one's own cumulated savings into consumption goods as desired or as occasion necessitates. Through bad times, individual misfortunes, or failure of income, one frequently finds it necessary to draw upon accumulated savings. Likewise those who have saved only a moderate amount during the earning period of life find it necessary with advancing age gradually to deplete their accumulated savings for current needs. Most often this takes the form of individual provision and management but frequently it takes the form of annuities, life insurance, and retirement policies. Much current consumption of savings also takes place through gradual depreciation of durable con-

sumers' goods such as dwelling houses and furniture. Demand from this source is a constant drain upon the total supply of accumulated capital.

The demand for liquid capital to meet the needs of current consumption has recently come into greater prominence through the development of instalment selling, Morris Plan banks, automobile and household finance companies, and similar institutions. Loans for consumption purposes are not new but are as old as recorded history. They assumed a prominent role in the middle ages when the high interest charged upon them encountered the opposition of the organized church and led to theoretical arguments against interest on all such loans. Within recent years consumption loans in the form of instalment selling have shown rapid development. Consumption loans of all kinds reached huge proportions in the depression year of 1931. During that year they exceeded \$4,000,000,000 and the total outstanding at the close of 1931 was over \$2,600,000,000. A detailed statement of these loans follows.

TABLE 13—SHORT-TERM PERSONAL LOANS IN THE UNITED STATES
(000 omitted)

Source	Total volume in 1931	Outstanding Dec 31, 1931	Interest charge
Personal finance companies (chattel loan companies)	\$ 525,000	\$ 300,000	\$ 90,000
Pawnbrokers	550,000	400,000	140,000
Industrial banks (Morris Plan and others)	320,000	230,000	24,000
Share loans by building and loan associations	225,000	270,000	18,000
Credit unions	60,000	42,000	3,000
Axias	60,000	35,000	3,800
Personal loan departments of commercial banks	320,000	180,000	25,000
Non-departmentized personal loans by commercial banks	1,000,000	1,000,000	90,000
Unlawful lenders of all kinds	1,000,000	125,000	350,000
Remedial loan societies	60,000	32,000	4,000
Employees loan associations	25,000	12,000	600
Total	\$4,145,000	\$2,626,000	\$748,400

Estimate of Franklin W. Ryan, Franklin Plan Corporation

In addition to these loans large amounts of life insurance funds have been supplied to policyholders. These have grown very rapidly within recent years and stood at over \$2,000,000,000 at the end of 1928.

The largest class of consumption loans is that representing loans on dwelling houses. These loans are covered by mortgages. The funds come ultimately from individuals, but are mostly applied through the activities of savings banks, building and loan associations, and insurance

companies. The annual demand for capital for the various consumption purposes is very great, how great one can only guess in the present state of statistical information

Speculative Demand.—Speculation is a trait of modern civilization. Its development of necessity belongs to the institutions of division of labor and exchange of goods and property. Speculative transactions occur in all kinds of goods but especially in land, capital, and durable consumers' capital, especially in foodstuffs, raw materials for textiles, certain metals, and so forth. The demand for capital for speculative purposes is distinct from the demand for the carrying of goods until they reach consumers. The speculative demand is most clearly seen in land and security markets. Speculators make a business of trading for profit largely among themselves and hence their capital is never permanently lodged in *bona fide* investments. Large portions are constantly free, awaiting a favorable opportunity for commitment, whereupon equal amounts are set free to other speculators who in turn await favorable opportunities for profit. The net result of these activities is that large amounts of funds, belonging partly to the speculators and originating partly in bank loans, are absorbed in these markets. Capital is thus withdrawn from productive enterprise and is constantly revolving with speculative activities.

The stock market at the height of its boom in 1929 employed over \$3,000,000,000 in this way. These funds originated from different sources. Normally they represent surplus bank credit employed mostly on call, so that they may be available when needed for business loans. But in 1929 they came also from corporations and individuals who took advantage of the high rates of interest offered for such funds. Ultimately large amounts were drawn from the public, who bought the bonds and stocks of corporations, and from investment trusts, which then took advantage of the high rates offered. The rate of interest exceeded even the fondest hopes as to what could be earned if the capital were employed in industry, and in addition the loans were extremely liquid in character.

In the three years following the peak of the market in September, 1929, brokers' loans shrank to about \$300,000,000, an insignificant figure, and the lowest sum since records have been kept. Funds thus released returned to their origin once more. Those originating from individuals and corporations again found their way into the capital market for permanent investment or were kept on deposit in banks, awaiting that opportunity in the future. But funds borrowed directly or indirectly from the banks and returned to them served merely to cancel loans and, therefore, like all such cases, permanently disappeared from the market. Yet not all suffered this fate. Many who borrowed through their brokers when stocks were acquired retained their securities

and subsequently borrowed on them directly from the banks, in which case permanent expansion of bank credit took place. The extent of collateral loans of banks has already been noticed in another connection. Here it is worthy of remarking that total collateral loans of banks (including brokers' loans) showed little decrease until 1931 was well advanced. Only then did many liquidate their credits at the banks.

In conclusion it may be observed that while speculative activity usually manifests itself in waves of greater or less intensity, nevertheless, at all times, large amounts of capital are tied up in these operations and hence withheld from the investment market.

Funding Operations—Another distinct although sporadic source of demand for capital comes from funding operations. The author has here in mind the juncture of the business cycle at which business concerns find themselves heavily burdened with bank and other short-term loans. This usually shows itself at the end of a boom period when banks, having loaned extensively for business purposes on high prices, come to the end of their rope and, discovering the unsound character of business and finance, reverse their lending policy by insisting upon the payment of loans. These loans are then found to be frozen, that is, illiquid, with the proceeds invested largely in fixed assets. Immediate payment of such loans can be made only through funding them into long-term obligations or through the sale of stocks. These operations are likely to assume large proportions as investors seek the opportunity to obtain the high interest rates which generally prevail at such times. The process now becomes one of investing funds in securities, the proceeds of which are employed to pay bank loans. No investment results from these transactions; the proceeds of savings are merely swallowed up in the cancellation of bank credits. Such demand for capital bears little or no definite relation to future productivity. The all-important question with the borrower is the avoidance of bankruptcy or receivership. The time for figuring profits has passed and the day of rescue is at hand, if that be possible. The price paid for the use of funds in this way, the interest rate, can have no connection with either present or future prospects of profits. It is merely a question of survival.

At this point it may be observed also that extensive demand for consumption loans comes from national, state, and local governments. Statistics have been given to show the purposes for these loans. The amounts are large. They represent demand for social consumption. Public expenditures increase, and along with them borrowing as social consumption gains over individual consumption. All leading governments of the world showed this tendency during the past quarter of a century.

Theory of Consumption Demand for Capital.—Regardless of the source from which funds are secured for consumption purposes, the

general theory underlying them is the same. Consumption demand for capital represents a time-preference in the consumption of goods. It is occasioned by the failure of current income to provide for current consumption demands of individuals or families. It represents an excess of current expenditures over current income. This deficit of income is made up by drawing upon society's fund of liquid capital. When funds are transferred from their owners to others who desire their use, they result in investment for income. From the point of view of their users, these funds represent future expected income. They represent a preference for current over future consumption. They entail the sacrifice of future income for present needs. The rate of interest paid when funds are thus borrowed represents a premium consumers are willing to pay in order to advance potential future consumption to the present.

Consumption loans are economically sound when the time of final payment does not extend beyond the service life of the goods which they represent. The question of policy is quite different, however. It may fairly be questioned whether sudden departure from established habits of thrift is advisable. Thrift and saving have long been regarded as virtues. This is a matter not so much of economics as of character and morality. The possession and care of property by its owner has been one of the fundamental institutions of civilized life and departure from this may bring results little contemplated. On the other hand, when borrowing for consumption purposes advances the thrift habit, it has the support of civilized experience. Such is the case of the ownership of a home with its undoubted advantage in preserving the unity of family and stabilizing the population. But consumption loans which lead only to extravagance and inadequate provision for the future are to be discouraged on the same ground.

From another point of view, consumption loans of the latter type have proved a detriment to society. Rapid advances in these loans in 1928 and 1929 led to an unnatural demand for consumption goods and thus to an artificial stimulation of industry which could not be maintained. This was undoubtedly a contributory cause of the inflation of those years and hence an important cause in the collapse of business which followed. The pace was too rapid for a while and it was followed by the inevitable retrenchment and decline in demand for goods on the part of the public.

Function of Capital.—The demand for capital in industry is predicated upon the profitable employment of the same. Economists have long spoken of the productivity of capital. This language, however, must not be taken too literally. Capital is merely one factor in the productive process. Capitalistic production is carried on through the cooperation of capital, land, labor, and management. These factors are not combined in equal proportions in all industries, so that the relative importance of the various factors of production vary with the nature of their combina-

tion Some occupations, for example, employ comparatively little capital and management but depend mostly upon labor Likewise retail and wholesale concerns turn their capital over five to ten times per year, so that only moderate amounts are needed, they depend largely upon labor and management in rendering their service On the other hand, manufacturing industries, on the average, turn their capital over something like once every year and at the same time give employment to large numbers of laborers and highly organized managerial forces Even here certain industries depend mostly upon capital for their service This is true where invention has given machinery an advantage over labor In such instances machine production has become largely an automatic process, as in the printing occupation, for example In railroads, public utilities, and shipping the turnover of capital is only about one-fourth or one-fifth per year Labor is still of great importance, while management has shrunk in proportion We might add also that the farming industry depends mostly upon land and its fertility with labor and capital of lesser significance

Although capital varies in importance relative to other factors of production, practically all forms of modern production require some amount of capital in combination with the other factors Yet in every case the product would be impossible without the employment of all of the factors in combination One, therefore, arrives at the conception of the cooperative character of modern production One cannot always go so far as to say that capital merely assists labor in production For to do so would place undue emphasis upon labor as a factor in production So important has capital become in certain industries that it seems more proper to say that labor and management assist capital Yet this is not a question of great importance if only we do not steer away from the main conclusion, namely, that "there is no separate productiveness of capital"¹

Ultimate Demand for Capital—The ultimate demand for capital, as well as for labor and management, lies in the demand of consumers for the products of industry The quantity consumers are willing to take at given prices determines, in the broadest view of the subject, the extent of capital employment in the various industries It is the effort of managers constantly to gauge the consumption demand for the various products of industry and to provide adequate equipment and organization to supply this demand Yet business enterprise is not automatic Leadership in foreseeing the future demand of consumers is a function of management, and it generally happens in the case of new industries that enormous capital expenditures take place before the consuming public has developed a conscious demand for the contemplated product The public is slow to change its habits of consumption for most of its wants. This often

¹ F W TAUBSIS, *Principles of Economics*, Vol II, p 8

renders capital in the experimental stage of production unprofitable. But when an article once gains favor with the public, great profits come to those who had the foresight to anticipate the demand.

Capital and Wages.—When one views the matter from the standpoint of the *entrepreneur*, one gets a more exact knowledge of the nature of demand. Many of the products now on the market are the same as those of a century ago but they are not produced in the same way. Then little capital was available, either because invention had not proceeded far enough or because savings were inadequate to take care of demand. But gradually as invention and accumulation of savings proceeded, capitalistic production became cheaper than production under the older methods, and capital began to take the place of labor. Wherever the operations of labor were standardized or became of routine character, invention became comparatively easy, so that today most of the labor has been relieved of automatic routine operations. From an economic point of view this was brought about because the machine outdid labor in efficiency so that the net cost to the producer and consumer alike was reduced. The reduction of costs in industry has long been and remains one of the chief problems with which management has to deal. This has a twofold aspect. It concerns, first, the relative cost of labor against capital and, second, the cost of newer forms of machinery against the older ones. The problem of obsolescence is quite as important in this situation as the price of labor. Nevertheless, the rise in real or relative wages since the pre-war days has spurred management to replace this factor with machinery whose cost of operation results in a lesser net cost in production. Thus we see in a very special sense that the demand for capital depends upon the status of wages and the course of invention and discovery.

The Law of Proportional Costs.—Economists recognize a law of proportional, or balanced, costs. If one places himself in the position of the manager, he may acquire some appreciation of his problem in production. The heart of this problem is the production of commodities and services at the lowest possible cost. The keenness of competition compels the manager to seek the most economical methods of production available and to arrange his technique accordingly. In this, the most significant aspect is the relative cost of labor and capital. Assuming a given efficiency of labor and a customary wage, the manager endeavors to substitute machinery at every turn, when the cost of it in terms of interest, upkeep, and depreciation come under the wage bill. As fast as new invention proceeds which will accomplish this result, he is able to introduce new devices to replace labor. In this process of substitution frequently the older forms of capital become obsolescent and must be scrapped in favor of the newer ones. The demand for capital from this cause is thus dependent upon the course of invention and trend in wages.

Undoubtedly the great demand for industrial capital during the past decade arose largely to offset the substantially higher wages paid workmen. This process also accounts for the constantly increasing amount of product per laborer employed in factories and one might add for much temporary unemployment of labor.

Demand and Reward.—Here the relation of the demand for capital to the reward for its services is discussed, in order to observe that the reward is the fruition of efforts, while the demand for capital must always be based upon anticipation of the future. But hopes are too often disappointed or utterly shattered when the final results materialize. Investment proceeds upon the best calculations that financial and industrial leaders are able to make at the time. This fact is of importance at this juncture because it implies no definite realized return in the future but indicates only hopes for future results. Industry frankly accepts the risk factor as a normal accompaniment of investment which proceeds upon hopes rather than upon realities.

Where the risk is great, hope for reward in proportion must be held out or capital will seek other opportunities. But wherever new funds are sought, the promise of reward cannot ordinarily go below a customary minimum with risk considered. It is quite needless to remind the reader at this point that all avenues of investment are not open to the investing public. Natural privileges and restrictions are found in certain industries. Monopolistic grants from governments, through patent and copyright laws, shut out certain fields from participation by the general public. Various other restrictions, such as the sluggish movement of capital, for example, still further limit the choice of the investor.

The Division of Risk.—The character of the investment market is such that a large portion of all capital seeking employment attempts to avoid most or all of the risk involved in industry. Modern finance has devised elaborate legal arrangements whereby the investor can assume as little risk as desired. This is accomplished through the issue of high-grade bonds. Here large investments in fixed property are often placed behind a limited amount of bonds, while the entire earnings and credit are pledged in order to make the limited investment safe. This division is most fortunate, for it undoubtedly leads to the accumulation of large amounts of capital that otherwise would receive insufficient encouragement. A large portion of the total demand for capital nowadays is rendered safe through this legal device.

Trading on the Equity.¹—The other side of the picture of the division of risk may be observed in the position of stockholders. This class of investors pledges its entire equity in property and earnings in favor of the creditors and thereby accepts all of the risk involved in the employment

¹ See Hastings Lyon's excellent treatment of this topic in *Corporation Finance*, Chap. II.

not only of the capital represented by the contribution of the stockholders but also that invested by bondholders. Yet if hopes are realized and the venture is a success, the reward of the bondholders is limited to stated amounts, while the earnings of the capital thus obtained, as well as those due to the stockholders' contribution, accrue to their benefit also. Here is a chance for extraordinary gain in exchange for extraordinary risk. Assume an investment of capital to be represented one-half by bonds bearing 6 per cent interest and one-half by stock. Now if 10 per cent is realized on the total investment, the bondholders sacrifice 4 per cent on their position which, when added to the 10 per cent on the stockholders' portion, brings a total reward of 14 per cent on the stockholders' capital. This simple illustration reveals the chief motive in the demand for capital through the issue of bonds. In this connection too we should also observe that frequently the promoting stockholders have contributed little to the capital of the enterprise, so that the gain, if any, is a reward solely for promotional activities. And when gains are thus capitalized in the market, the entire value of the stocks must be considered in order to get the total gains from the venture. To view the matter in a different situation, in case only 3 per cent is realized on the total investment, the bondholder stands good to receive his entire 6 per cent while the stockholder's share is nil.

Investors versus Managers.—The interests of investors and the managers of industry are in a sense opposed to each other. The investor demands certain guarantees and financial standards as a protection against needless loss. The managers, on the other hand, want freedom of action, a flexible financial structure, and a certain secrecy of affairs. To strike the right balance between these opposing interests is the task of the investment banker. The public must not be called upon to assume undue risks, and above all it must have faith in the financial uprightness of the managers. Contracts must be made which can be enforced, and the confidence reposed in the managers by investors must not be violated. On the other hand, investors must recognize the inevitableness of the risk factor in enterprise. They must select the type of security which suits their particular need and willingly assume the risks involved in its ownership.

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CHAPTER V

THE RETURN TO INVESTED CAPITAL

The tenor of the two preceding chapters has been to show that those who have capital to invest have accumulated it out of a variety of motives and with certain ends in view, no one of which is predominant. The ordinary rate of return expected on capital, that is, the interest rate, is an influence of only mild proportions in encouraging savings, but the prospect of exceptional gains holds out special inducement to increased savings. Other things being equal, capital once saved seeks employment where the return is greatest. On the other hand, those who seek the use of capital do so upon the hope or prospect of realizing a return at least equal to the ordinary figure, and, where the prospect is bright for exceptional return, demand for capital will be specially strong. Thus both capitalist and *entrepreneur* seek the opportunities where hopes are highest and prospects most alluring.

Here comes up for consideration the actual return experienced by business enterprise in its entirety and in the several fields of capital employment. The objective here is to observe the working of certain general principles which have long been a matter of theoretical knowledge, and to note the modifying conditions which at times seem to defeat the concrete realization of these principles.

Financial Results of Business.—The discussion of the profitability of business enterprise may best be preceded by presenting the broad results of finance as revealed by the accountant's calculations. It is owing largely to the administration of the federal income tax, first enacted in 1909, that these results are now available. They enable us to examine with renewed interest certain theoretical economic principles with a view to their verification. They also spur us to look for countervailing factors which defeat precision in the final results of business endeavor. Statistics for this purpose are found in the annual volume of *Statistics of Income* compiled by the Bureau of Internal Revenue of the Treasury Department. First is presented a broad picture of the results of American corporate business during the past 11 years.

These data are highly significant. They show, first, the surprising number of corporations reporting a deficit each year. In the depression years of 1921 and 1930 corporations showing a deficit outnumbered those showing a net income and in the prosperous year 1928, when the best showing was made, 35 per cent of all concerns reporting had a deficit.

TABLE 14.—INCOME OF CORPORATIONS

Year	Number of returns	Percentage reporting		Net income (000,000 omitted)	Deficit (000,000 omitted)	Percentage of deficit to net income
		Net income	No net income			
1920	345,595	59	41	\$ 7,903	\$2,029	26
1921	356,397	48	52	4,336	3,878	89
1922	382,883	56	44	6,964	2,194	31
1923	398,933	58	42	8,322	2,014	24
1924	417,421	57	43	7,587	2,224	30
1925	430,072	59	41	9,584	1,963	20
1926	455,320	57	43	9,673	2,169	23
1927	475,031	55	35	8,982	2,472	28
1928	495,892	54	35	10,600	2,400	23
1929	509,436	53	37	11,654	2,914	25
1930	498,110	43	57	5,627	4,205	75

Statistics of Income

Year in and year out it appears that about 40 per cent of all corporations shows deficits. When the amount of the net income is compared with the amount of the deficit, the picture is somewhat better. Nevertheless, even in 1928, the deficits were 23 per cent of the net income, while in the depression years of 1921 and 1930 deficits mounted to 89 and 75 per cent respectively. Undoubtedly the showing for 1931 was still more unfavorable.

Income According to Size.—The failure of so large a number of corporations to show a net income year after year leads us to seek an explanation in the size of corporations which thus fail. The table given below goes far toward explaining the poor showing brought out in the preceding table. For instance, of all corporations showing a net income in the prosperous year of 1928, 77 per cent of them showed income under \$10,000 each, while 16 per cent more had income from \$10,000 to \$50,000 and only one-half of 1 per cent showed income of \$500,000 to \$1,000,000 each. On the average, it seems that, of all corporations reporting a net income, something like 75 per cent is found in the lowest income class and over 90 per cent falls within the two lowest classes. Corporations showing net income of \$1,000,000 or more on the average constitute only about one-half of 1 per cent of the total number and those with \$5,000,000 or more are a negligible proportion of the total. We should observe here also that corporations with large incomes show more varying fortunes from year to year than corporations with smaller incomes. This difference is plainly seen in the depression years 1921, 1924, and 1927, as also in the prosperous years in the intervals.

TABLE 15—NUMBER OF CORPORATIONS CLASSIFIED ACCORDING TO SIZE OF NET INCOME
(Classes in thousands)

Year	Total	Under \$10	\$10 to \$50	\$50 to \$500	\$500 to \$1,000	\$1,000 to \$5,000	Over \$5,000
1920	203,233	150,388	35,994	14,713	1,142	836	160
1921	171,239	135,987	25,327	8,839	555	461	70
1922	212,535	160,548	35,811	14,315	1,016	725	120
1923	233,339	175,111	39,764	16,329	1,089	858	168
1924	236,389	170,275	39,411	14,850	952	739	162
1925	252,334	188,848	43,498	17,719	1,156	917	196
1926	258,134	197,373	41,713	16,851	1,100	833	214
1927	259,849	201,465	40,034	16,169	1,139	855	187
1928	268,903	207,736	41,408	17,195	1,286	1,029	229
1929	269,430	209,308	40,861	16,573	1,344	1,049	300

Statistics of Income

For the past few years the Bureau of Internal Revenue has also classified corporations showing a deficit according to size of the net income. For the 3 years 1927-1929, on the average, corporations having deficits under \$10,000 each constituted 80 per cent of the total. If the next group is taken in, those having deficits up to \$50,000 each, the two classes together constitute 96 per cent of the total. It is furthermore surprising to find that within this period of more than average prosperity so many corporations of larger size reported deficits. Those reporting deficits of \$1,000,000 or more numbered on the average 223, while those of \$5,000,000 or more averaged 17 annually. A comparison of the number of larger corporations with net incomes and deficits shows that those with deficits of \$1,000,000 or more each were 18 per cent of those with net income of equal amount, while those with deficits of \$5,000,000 or more each were 7 per cent of those with like amount of net income. One more observation gleaned from Tables 15 and 16 shows that in the three years 1927-1929, of all corporations reporting, on the average, 78 per

TABLE 16—NUMBER OF CORPORATIONS CLASSIFIED ACCORDING TO SIZE OF DEFICIT
(Classes in thousands)

Year	Total	Under \$10	\$10 to \$50	\$50 to \$500	\$500 to \$1,000	\$1,000 to \$5,000	Over \$5,000
1925	177,738				251	140	8
1926	197,186				241	131	16
1927	165,826	130,973	27,390	7,000	257	188	18
1928	174,828	140,211	27,539	6,595	287	186	10
1929	184,591	148,833	29,714	7,436	341	244	23

Statistics of Income

cent had either net incomes or deficits of less than \$10,000 each. These results reveal an interesting mediocrity of experience of the smaller corporations

Still more interesting and valuable as investment experience are the results considered on the basis of the total amount of income or deficit within the different-size groups. Table 17 relates to net income and shows that the total net income of corporations in the lower class ranges is small indeed when compared with that of the larger ranges. For instance, on the average, corporations having net income of \$10,000 or less each, which constitute the great bulk of all corporations reporting net incomes, account for only about one-half of 1 per cent of the total income, while those of \$5,000,000 or more net income, each, account for something like 40 per cent of the total income. Again we notice the greater variability of income from year to year in the larger corporations when compared with those in the lower ranges.

TABLE 17—AMOUNT OF NET INCOME CLASSIFIED ACCORDING TO SIZE OF INCOME
(Classes in thousands, amounts in millions)

Year	Total	Under \$10	\$10 to \$50	\$50 to \$500	\$500 to \$1,000	\$1,000 to \$5,000	Over \$5,000
1920	\$ 7,902	\$410	\$786	\$2,804	\$788	\$1,626	\$2,203
1921	4,336	327	547	1,189	380	918	971
1922	6,963	397	767	1,961	708	1,444	1,681
1923	8,321	439	891	2,245	752	1,695	2,294
1924	7,586	438	858	1,966	662	1,447	2,210
1925	9,583	465	975	2,377	788	1,876	3,097
1926	9,673	465	929	2,278	759	1,769	3,468
1927	8,981	463	889	2,195	788	1,700	2,938
1928	10,610	509	912	2,362	898	2,119	3,810
1929	11,644	511	899	2,301	932	2,116	4,885

Statistics of Income

The relative success of the larger corporations when compared with the smaller ones is further revealed in Table 18, showing deficits by classes. The tendency here is for the total deficits to decline in importance as the corporations grow larger in size, a tendency directly opposite from that noticed with reference to net income. Viewed from another angle, the combined deficits of all corporations reporting deficits up to \$10,000 each for the years 1927-1929 amounted to 13.2 per cent of total deficits, while total incomes of those reporting net income up to \$10,000, each, amounted to only 4.5 per cent of the total income. On the other hand, the total net income of all corporations averaging \$5,000,000 or more each for the same years was 37.3 per cent of the total, while the total deficits of corporations reporting deficits of \$5,000,000 each were only 7.7 per cent of the total.

TABLE 18—AMOUNT OF DEFICITS CLASSIFIED ACCORDING TO SIZE OF DEFICITS
(Classes in thousands, amounts in millions)

Year	Total	Under \$10	\$10 to \$50	\$50 to \$500	\$500 to \$1,000	\$1,000 to \$5,000	Over \$5,000
1925					\$171	\$264	\$130
1926					178	257	90
1927	\$2,471	\$317	\$581	\$853	176	351	168
1928	2,383	344	575	780	200	342	142
1929	2,776	365	526	924	236	468	287

Statistics of Income

Perhaps more significant than the above figures is the percentage return of income on total assets by classes. Income here is that reported by the Bureau of Internal Revenue and is calculated after interest and taxes, except federal income taxes. In 1928 corporations of \$1,000,000 or more income each earned at almost twice the rate of those whose incomes were under \$25,000 each.

Earlier Experience.—Further evidence obtained from the same source bearing upon earnings in the pre-war and war years may be added to these data. A report of the Bureau of Internal Revenue covering the 3 years 1911-1913 shows the percentage of average earnings to invested capital for 10,020 corporations.

TABLE 19—AVERAGE EARNINGS FOR 10,020 CORPORATIONS, 1911-1913

Percentage net income to invested capital	Number of corporations	Net income
Under 6	1,368	\$ 19,010,000
6 to 8	737	26,769,000
8 to 12	2,415	168,246,000
12 to 20	2,929	163,090,000
20 to 30	1,866	93,003,000
30 to 40	553	35,429,000
40 to 50	233	17,817,000
50 to 75	259	16,656,000
75 to 100	75	7,605,000
Over 100	85	4,719,000
Total	10,020	\$552,849,000

FROM DAVID FRIDAY, *Profits, Wages and Prices*, p. 41

Out of the total of 10,020 corporations, 4,520, or 45 per cent, earned less than 12 per cent on the invested capital, while their earnings amounted to 38.7 per cent of the total. The number earning between 12 and 30 per cent was 4,295, or 42.8 per cent, their earnings were 46.3 per cent of the total. The number earning over 30 per cent rapidly diminishes to only

1,205 in all, or only 12.1 per cent with 15 per cent of the total earnings. There is, also, a noticeable tendency toward higher earnings in direct ratio to the size of the corporation. The outstanding fact, however, is the widespread, almost uniform, distribution of the earnings up to 30 per cent on the invested capital. Figures for 1918 for 7,000 of these same corporations show similar results.

Another report, made by the Treasury Department to the Senate on Corporate Earnings and Government Revenue for 1917, shows significant results.

TABLE 20—FINANCIAL RESULTS OF 31,045 CORPORATIONS FOR 1917
(In thousands)

Income range, percentage to invested capital	Net income before taxes	Invested capital	Percentage net income before taxes to invested capital
Under 10	\$ 477,013	\$ 6,250,000	7.6
10 to 15	389,211	3,000,000	13.0
15 to 20	513,411	3,400,000	17.0
20 to 25	481,519	2,600,000	21.8
25 to 30	260,729	1,200,000	27.0
30 to 33	234,152	1,000,000	30.1
33 to 40	285,680	1,100,000	35.4
40 to 50	794,487	2,700,000	44.1
50 to 75	178,273	500,000	58.6
75 to 100	71,066	150,000	89.0
Over 100	67,060	100,000	118.1
Total	\$4,760,933	\$22,000,000	21.7

From FRIDAY, op cit, p. 37

From this table the following observations may be made. Of the invested capital here represented, 28.4 per cent earned under 10 per cent on the investment, 29.1 per cent earned between 10 and 20 per cent, 26.8 per cent earned between 20 and 40 per cent, while 15.7 per cent earned above 40 per cent. The return to capital invested in corporate enterprise seems fairly well distributed from nothing up to 40 per cent, but from this point upward a rapidly decreasing percentage is shown. An examination of conditions for 1916 shows essentially the same results.

A more detailed statement of the results of 30,892 corporations for 1917 is shown at top of page 83.

Every industry, except, perhaps, railroads and public utilities, shows a wide spread in the earnings of capital invested in different establishments. In all of the industries considered, the percentage of capital earning under 10 per cent varies from 2.4 to 78.2 per cent, that earning between 10 and 20 per cent varies between 1.9 and 46.7 per cent, between 20 and 30 per

TABLE 21—PERCENTAGE OF EARNINGS TO CAPITAL OF 30,892 CORPORATIONS FOR 1917

Percentage net income to capital	Financial corporations, per cent	Railroads and public utilities, per cent	Transportation, per cent	Agriculture, per cent	Manufacturing and mining, per cent
Under 10	23 3	78 2	2 8	14 3	2 4
10 to 20	46 7	20 6	1 9	30 2	19 6
20 to 30	10 7	1 1	7 2	20 0	20 7
Over 30	19 3	0 1	88 1	35 5	57 3
	100 0	100 0	100 0	100 0	100 0

Adapted from FRIDAY, *op cit*, p 39

cent, from 1 1 to 20 7 per cent, for capital earning over 30 per cent, the variation is from 0 1 to 88 1 per cent

Recent Comparative Results—Since 1926 *Statistics of Income* shows the assets and liabilities, in addition to income items, of all corporations classified in broad groups. This enables us to calculate the amount of income available for the use of capital. To the "compiled net profits" has been added "interest paid," and from the sum of these two items the amount of the income tax (item K) has been deducted. These adjustments from the statements as they appear enable us to approximate the annual return upon the total capital employed by corporations. The table follows.

TABLE 22—PERCENTAGE RETURN TO TOTAL ASSETS OF ALL CORPORATIONS BY CLASSES

Industry	1926	1927	1928	1929	Average
Agriculture and related industries	2 2	2 2	1 4	2 5	2 1
Mining and quarrying	3 3	1 5	2 0	3 2	2 5
Manufacturing	6 6	5 7	4 2	7 4	6 0
Construction	5 8	5 7	1 2	4 8	4 4
Transportation and other public utilities	5 4	3 6	3 8	5 1	4 5
Trade	5 2	5 3	1 8	4 4	4 2
Service	4 7	3 5	2 1	4 1	2 6
Finance	3 5	1 9	0 7	3 2	2 3

Calculated from *Statistics of Income*

An outstanding result of this calculation is the material difference in the profitableness of capital invested in the various groups of corporations. The average return to corporations in the manufacturing group was 6 per cent, which is the highest for any group. The percentages in the three groups of construction, transportation and other public utilities, and trade are approximately equal but materially below that on capital

invested in manufacturing enterprises. Lowest in the list are the following groups: agriculture and related industries, mining, service, and finance corporations. The percentage return to capital invested in these groups is only between one-third to one-half of that invested in the manufacturing group. A more detailed statement of results undoubtedly would show a smaller return for transportation than the 4.5 per cent appearing in the table and a larger figure for other public utilities. It may reasonably be inferred that manufacturing and utilities other than transportation make the best showing. The percentage return to the finance group is scarcely comparable to that for the other groups, since commercial banking corporations employ the capital of others with a minimum of compensation to them. As a matter of fact, the percentage return to banking capital is among the highest if we may judge from the following figures:

TABLE 23 —PERCENTAGE NET EARNINGS TO CAPITAL AND SURPLUS OF NATIONAL BANKS

Year	New York City	New England	Middle Western	Southern	Pacific
1900	16.69	6.86	10.10	10.88	11.68
1910	10.90	8.68	8.89	10.10	12.19
1919	19.04	9.93	11.21	11.14	10.63

Net annual earnings per \$100 of capital funds of all member banks of the federal reserve system between 1923 and 1929 ranged from \$7.69 to \$9.14.

Business Failures.—To these data may be added the statistics of business failures during the past 11 years:

TABLE 24 —BUSINESS FAILURES

Year	Number	Liabilities	Year	Number	Liabilities
1921	19,652	\$627,401	1927	23,146	\$520,104
1922	23,676	623,896	1928	23,842	489,559
1923	18,718	539,386	1929	22,909	483,250
1924	20,615	543,225	1930	26,355	668,283
1925	21,214	443,744	1931	28,285	736,309
1926	21,773	409,232			

Dun's Review

These figures show an appalling number of failures annually with their large amount of liabilities even in the prosperous years. The amount of liabilities does not measure the total amount of capital employed in these unfortunate concerns. One can only guess at the amount of the equity of the proprietors which is largely sacrificed to the credits.

Low Level of Profits.—It has long been observed that the return to capital employed in the older countries and in stabilized industries is at a

low rate. On the other hand, in the newer countries and in developing industries the return is high. In the former case capital is said to be less, and in the latter more, productive. This is true not only of capital but of all the other factors of production, since all combine to produce the product jointly.

A general conclusion to be drawn from this body of evidence is that the level of profits to business enterprise in its entirety or by industrial groups is very low. This is undoubtedly a verification of the general law of diminishing returns to capital. No group of industries seems to be exempt from the general results. The relentless operation of the law of diminishing returns is easily the most powerful of all economic forces affecting the profitability of capital. This law, however, is not to be confused with the law of balanced production. The law of balanced production, or balanced costs, brings about the least expensive combination of all of the factors of production in a given situation. The character of the productive process is constantly changing in response to changes in the different factors employed. Substitutions of one factor for another are made when changed conditions no longer result in the least expensive combination. But the law of diminishing returns is based upon the nature of the ultimate consumption demand for commodities and services. This law is similar to the laws of diminishing utility and marginal utility. When production exceeds the customary demand, values decrease and, if the commodity happens to be one for which the demand is inelastic, disastrous consequences follow, prices fall and the reward, not only to capital but to the other factors in production, suffers. This is best shown by the large amounts of capital continuously being used in an unprofitable way. Other large amounts undoubtedly show only a meager return on the amount invested. Almost every industry contributes its share of capital employed with unfavorable results. The continuous accumulation of new capital seeking investment renders the return more and more unprofitable unless counteracted by opposing forces.

Inventions and Discoveries.—Economists have long pointed out that the most important factors in retarding the effect of the law of diminishing returns are new improvements and processes and new discoveries. Savings are continuously increasing in a quasi-automatic fashion. As Professor Taussig puts it, the ultimate outcome "depends upon a race between accumulation and improvement."¹ Improvements of the character above suggested operate, in the first place, to broaden markets for the products of industry. They exercise their most telling influence, however, in the creation of new products which make strong appeal to the general public, and in the reduction in the cost of production, leaving a wider margin of profit for the producer. The development of new markets and new industries and the lessening of cost in the older ones are

¹ F. W. TAUSSIG, *Principles of Economics*, Vol. II, p. 27

powerful forces indeed, which have thus far defeated the logical end of the continued accumulation of capital

Effect of Good Management.—The human element also plays its part in staying off the effects of the law of diminishing returns. New discoveries and inventions require the initiative of management to apply them to industrial ends. The commercialization of the advantages of new inventions proverbially is long postponed. It requires the genius of the promoter to utilize the potential gains. The quest for greater return on new capital investments is the driving force back of the commercialization of new technique.

Management too has reduced the cost by improving the efficiency of the human element in the production and marketing of goods. Better and more scientific methods of adapting the workers to their tasks, the development of a superior marketing organization, the utilization of science directly in research departments of large corporations and associations of producers, the scientific organization of the management force itself in order to cope with the problems of management in large-scale production; all these have assisted in widening the margin between cost and price and hence have added to the profitableness of invested capital. The differences in financial results of companies of various sizes in every class of industry are largely attributable to the quality of the management. Gradually the unfit are forced out and the fit occupy the field.

The ability of management to influence operating results is limited in direct proportion to its importance in the productive combination. Where capital investment is large in proportion to gross receipts, as in the utilities for instance, the element of management is of lesser importance. But in the manufacturing and trade occupations in general, gross receipts are large in proportion to capital investment. In the latter instances the result depends largely upon the ability of the management to find a market for the product and to control costs in production. The human element is important in proportion as its efforts are able to affect the net results of business and financial operations.

Lack of Uniformity of Results.—A second general conclusion is that, regardless of whether we have in mind industry in its entirety or specific groups, the range of return on capital according to the size of the enterprise is extremely wide, the extremes being huge deficits and huge profits. A large percentage of all capital employed earns nothing, while most of it shows earnings rather evenly distributed up to 30 or 40 per cent annually. The result of much of the invested capital seems to fall far short of hopes entertained at the time the investments were made; for without a minimum of return promised, it is difficult to understand why any investment should be made at all. Yet the amount of capital actually showing deficits and returning only a meager percentage on the investment is astounding and reveals a great gulf between prospects and realities.

Moreover, it is quite impossible to discover anything in actualities corresponding to the theoretical "margin" of productivity or the "representative firm." The results are rather evidence of the uncertainties of economic enterprise. They often stand as a mockery to the best efforts of management and as a warning to the careful investor.

Immobility of Capital.—The differences in the return to capital in the various fields of enterprise are not entirely due to the forces just considered. Other important factors enter into the situation. Among these are the immobility of capital, monopolistic elements, the risk factor, changes in the price level, and others.

Fixed Capital.—In speaking of the current capital supply, economists usually emphasize the mobility of capital in contrast with labor. However, when dealing with the question of differences of return to fixed capital investment over the different fields of industry and territorial areas, it is not the mobility but the *immobility* of capital that should be emphasized. Immobility is clearly seen in the case where capital once committed to an enterprise can scarcely ever be utilized in other enterprises. As long as it does not become obsolescent, capital will gradually be recovered by amortization out of earnings. But even this provision for recovery in practice does not always turn out as intended. Moreover, it is the established habit of industry to maintain itself as a going concern by reinvesting surplus earnings in additional plant facilities, even when confronted with the possibility of failure, so that if failure actually occurs, the organization finds itself with large plant capacity and practically no cash resources. In attempting to realize on either plant or inventory, large losses invariably result. For the most part, therefore, capital once committed to an enterprise is irrevocable.

Liquid Capital.—Liquid capital is far more mobile than fixed capital or the labor supply. Its liquidity has gradually increased with the development of money, credit, and banking, and the concentration of banking funds under modern centralized banking systems is indeed a marvelous accomplishment. Yet even under the Federal Reserve System bank interest rates show substantial differences in different sections of the country. But the current supply of capital funds, as distinguished from the credit funds of the banks, is far less fluid. Corporate surpluses possess scarcely any fluidity and are habitually reinvested in the corporate property. At the other extreme are the funds of institutions such as life insurance companies and investment trusts, which possess a high degree of mobility. The mobility of funds of savings banks and building and loan associations is restricted by law. Individual savings still possess a homing instinct and tend to move in restricted channels.

The lines of cleavage for new capital funds will be briefly indicated. Among the underlying causes of the immobility of capital is territorial cleavage. This manifests itself in the broadest way through international

barriers to the free flow of investment funds. In a large country like the United States, sectional investment influences are also very strong. Even localities show a surprising tendency to keep capital at home. Only the largest cities are provided with adequate marketing facilities. But large financial centers scarcely serve the needs of agriculture and sectional enterprises, they confine their efforts mostly to national corporations.

A third factor in the situation is the influence of ignorance and prejudice. Publicity of financial affairs is still very backward, so that only the professional investor and banker have a broad acquaintance with the investment market as a whole. What information there is available is largely inaccessible to the general public and the banker generally has his special interests to serve. New industries in particular have to knock hard at the door of the banker for funds.

Competition.—Perhaps the most vital and persistent of all forces limiting earnings is competition. One may profitably distinguish three forms of competition. (a) The traditional form is in the price of commodities. The theoretical limit of survival is reached when, through competition, prices are reduced to the point where adequate return to the capital invested cannot be secured. Were the costs of all the producers of the given commodity the same, the profits for all would be at a minimum and price would be stabilized at that point. But the costs are not uniform for all producers. Hence (b) competition of costs plays an important role. Most of the advantages of large-scale production represent advantages in cost over small producers. Advantages in costs are usually occasioned by superior management, better technical equipment, more favorable location with reference to raw materials, the market for the product, and so forth. It is well known that unit costs in large-scale production have led to the keenest kind of competition. Competition in costs is, perhaps more than any other one thing, responsible for the weeding out of inefficient producers. High wages have forced economies in cost by substituting machinery for labor where possible. Organizations that are in a position to command the necessary capital for this substitution survive where others fail. The automobile industry is a striking example of elimination by competition in costs.

A third species of competition is (c) in substitute commodities. Illustrations of this are found in the shoe and textile industries. In the case of the former, cheaper cloth and composition substitutes for leather reduced profits on leather materials almost to the vanishing point. In textiles, the rayon, cotton, and woolen goods producers have done little since the war but play the game of hide and seek with each other. This form of competition bids for the consumer's purse through elaborate advertising on a national scale, the costs of which are borne to a large extent by the producers themselves unless the efforts bear fruit.

Monopoly.—A large proportion of all industry operates under conditions of monopoly rather than competition. The economic theory of monopoly price is based on the greatest net profits to the producer. Monopolies do not always reach the objective of maximum earnings which the theory demands, because of the limited knowledge of the monopolist or his inability to command sufficient capital. Monopoly prices are usually higher than competitive prices, and profits almost always in excess of competitive profits. For these reasons governments almost everywhere have come to exercise a controlling influence in monopoly prices as well as in the general conduct of monopolized business. Monopoly industries which have had their profits strictly limited by public authority in the United States are the railroads, electric light and power, telephone, telegraph, and other public-utility enterprises. Government control of railroads has undoubtedly been a factor in their restricted earnings. Banking institutions have large monopolistic elements inherent in their nature. Reputation and growth into the business fabric cannot be achieved in a day. Clearing house agreements restrain competition in the payment of interest on deposits. In this connection one should not forget the influence of the legal monopolies created through patent rights, copyrights, and trademarks. The ramifications of monopolistic influences are great and undoubtedly exercise an important influence in the financial results of business.

Changes in the Price Level.—General changes in the price level have a profound effect on profits. If the prices of all commodities became adjusted to the previous relationships, the transition periods only would be important. But price changes are seldom uniform. One is not so much concerned here with the temporary effect of price changes, which shows itself in the adjustment of inventory values, as with their effect on the value of fixed capital and land. In this connection severe declines in commodity prices reduce the cost of newer plants and equipment and thereby give new competitors with low-cost plants and equipment an advantage over the established industries with their high-cost capital. Should the present low level of commodity prices prove permanent, great advantage will accrue to new concerns in competitive industry. The disadvantage is likely to extend also to the regulated industries under the theory of reproduction valuation of plants for rate-making purposes. It follows from this general reasoning that industries whose investment is large, in proportion to the value of the products, suffer most in these price changes.

A persistent force in business profits is found in the rhythmical movements of business itself through the different phases of the business cycle. The problem is to maintain a profitable margin between costs and selling prices in the face of uneven changes in these two variables. It requires the highest order of management successfully to steer an organization

through the boom period without plunging it into distress as the inevitable period of catastrophe descends upon industry. Profits are quickly converted into losses largely through inventory depreciations. Industries whose period of manufacture is long, or whose inventory turnover is slow, are especially hazardous. Likewise, those engaged in the production of raw materials are likely to suffer most on account of changing prices. Most helpless of all are controlled industries where prices and rates are strictly limited by public authority but costs left to vary in response to supply and demand. These industries usually inherit a legacy of high wages which persist through depression periods when it is impossible to receive any offsetting increase in rates on account of the general debility of business.

Dynamic Character of Industry.—Another general factor which plays an important role in the results of economic enterprise is the dynamic character of economic life. This manifests itself in changing habits of the consuming public and progress in the technique of industry itself. Changing habits of consumers are largely responsible for the troubles of the textile, musical instruments, theatrical, and other industries. So also the passenger traffic of railroads and street-car systems has suffered severely from the automobile and autobus. Within industrial organization itself profound influences for change are at work. The difficulties of both retailer and wholesaler of the traditional type are constantly being multiplied by the success of chain stores and mail-order houses. Other prolific sources of industrial difficulties are found in the activities of governments. Government competition in industry, the passage of tariff acts, and control of wage scales are only a few of the many examples that come to mind. Lastly should be emphasized the maladjustment of large sections of industry as a legacy of the war. Overexpanded capacity in production is still manifest in the copper, coal, sugar, fruit, and other industries. Of equal importance is the curtailment of demand in the world markets for American products as a result of the impoverishment of European countries by the Great War. Maladjustments of industries from international catastrophes of this sort frequently require decades to right themselves.

Risk and Profits.—The risk factor is an important influence in business profits but the manner of its influence often allows it to escape attention. Economic theory demands compensation for risk. It is thoroughly logical to demand a greater return in the risk-bearing industries than in the riskless enterprises. Again this is mostly a matter of hopes rather than realities. The *promise* of large profits is in itself sufficient to attract large amounts of capital. But an examination of the financial results of the risk-bearing industries, such as the mining industry, reveals that profits are either insignificant in amount or, as claimed by some, non-existent. Compensation for risk then seems to have little application in

industries taken as a whole. But where risk is great, there is a human inclination, an incurable predisposition, to take a gambler's chance. The word risk itself implies that certain elements in the situation are unknown and unknowable. Gambling thrives on uncertainties and, where there are only a few prizes, the losers must greatly outnumber the winners. Industries affected by exceptional risks are essentially prize-drawing contests, and like all such contests the contributions often exceed the prizes. Some undoubtedly have made rich strikes in mining and the development of new industries and products—bonanzas as it were—while multiplied numbers have not only failed to prosper but have actually lost what capital they risked in the enterprises. Were it possible for the average investor to diversify his commitments among numerous well-selected enterprises, it is possible that in the long run income might be increased in this way. But such a degree of diversification as this would call for is seldom possible with limited funds. The principle of diversification is practiced by various investment institutions which command large funds, but, for these, ventures of exceptional risk are ineligible. It would seem, therefore, that risky ventures are destined to remain prize-drawing contests with the theory of compensation for risk of only limited usefulness.

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CHAPTER VI

INTEREST AND PROFITS

In the discussion of the return to invested capital, sound principles of accountancy were assumed. At this point, however, it may be specified that what has been called the return to capital is the share belonging to capital after deducting all of the expenses and outlays of production. These include the cost of raw materials, transportation charges, wages of labor, salaries of the managerial and sales forces, insurance, taxes, depreciation, and depletion, in short, every expense connected with the productive process—save alone the reward for the use of capital itself. All of these items of expense constitute in both law and economics prior claims upon the gross income of business concerns. The return to capital is, therefore, residual, or contingent, in nature. Capital thus accepts the most uncertain portion of the gross income of business as its reward for the responsibility of success or failure of enterprise.

The share remaining for capital, and finally accredited to capital, is ordinarily spoken of in economics as the product of capital. It is the tangible evidence of the "productivity" or usefulness of capital. But when applied to the share going to capital, the term productivity has a somewhat different implication from that when applied to labor and land. Wages constitute the reward for the services of labor and rent for the use of land. In both wages and rent the price is fixed by general forces operating over the entire field of industry. The demand for labor comes from industry as a whole and the scale of wages brings about the equilibrium of the general forces of supply and demand for labor over the field of industry in general. The individual employer is, therefore, helpless in the determination of a wage scale but must accept what the general law dictates. In the case of rent, the price paid for the use of land, the situation is similar. Urban rent is determined by the usefulness and broad demand for sites and the amount is fixed by general economic and social forces. But in the case of the return to capital the responsibility rests upon the management and upon the owners of capital in individual enterprises. When hopes are not realized, losses result and must be borne by the owners of capital. It is this residual character of the share of capital in the results of enterprise that gives a special stamp to investment income. It is this feature of capital's share of the earnings of industry that has led to the numerous devices in law to divide the income into various parts, apportioning or segregating risk and income to suit the varied demands of the investment market.

Gross and Net Return.—The residual share accruing to capital may be called the gross return. The investor, however, does not receive the entire amount of capital's share in the total product. The first important deduction is that made by the corporation or business concern for its surplus and undivided profits accounts (neglecting for the moment outlays for interest). The needs of the business come before the wishes of the stockholders and distributions are made according to the principles of expediency. Nevertheless, stockholders and proprietors have an equity in the surplus and undivided profits account even though the funds represented remain with the business concern. They represent forced savings in much the same way as taxes do, except that they are reinvested for the benefit of their owners.

If attention is confined, from this point on, to the actual disbursements of the earnings to the owners of capital, these may be designated as the investors' gross return on the total amount of capital employed. Certain further deductions are necessary before arriving at the conception of net return. Economists point out that there is a certain amount of cost incurred in the process of investment itself. They refer to the necessary care in handling funds. Some investments are almost free from these disadvantages, while others demand continuous attention. Short-time loans, for instance, require constant attention in reinvesting the funds as the loans come due, and if they are made in small amounts, material expenses are incurred in investigating the character and responsibility of borrowers. Nowhere is this seen more than in the various consumption loans made by pawnbrokers, Morris Plan banks, household and automobile finance companies, and the like. In regulating these loans, the law frequently fixes maximum "interest" charges of 20 to 25 per cent against borrowers, thus recognizing the expenses involved in making such loans. By far the larger portion of these charges is absorbed in expenses, so that little more than the normal interest may be realized.

Marketability.—It has often been pointed out that investors are generally reluctant to invest in securities and enterprises if the chances of recovering their money when needed are poor. It may be said that lack of immediate recoverability of funds is inherent in the investment process. This is undoubtedly true when viewed from the social point of view. Final recovery of invested capital must indeed wait upon the slow process of amortization and, if depreciation funds are reinvested in the same business, recovery is indefinitely postponed. To obviate this situation, investors demand marketability of their securities. In theory this means simply that, while investment as a social process, of necessity, represents the congelment of funds in the apparatus of production, yet individual investors may be given the opportunity of disposing of their securities for cash through appropriate marketing machinery. The organized security markets give the best opportunity for the exercise of

this option. In case of unhstet securities the market is often of restricted and sluggish character, so that the recovery of invested funds is accomplished only at a considerable expense or sacrifice. True marketability implies recovery with a minimum, or no, loss. For the privilege of marketability investors are willing to pay a price which in the final reckoning represents a deduction from their gross income.

One thus arrives at the conception of net return from investments. As a conception, net return may be defined as the money return to investors after deducting from the gross return expenses incurred in investing and payment for the option of marketability. The division of the net return and the apportionment of risk is the problem of interest and profit.

Interest—Like most economic terms, interest has a variety of meanings. Perhaps the most common usage of the term holds that interest is money paid for the use of money lent. This conception is probably of legal origin. In law, interest arises when money is lent by one party to another and payment promised for its use. In case of default, legal action may be instituted. Legal sanction provides the element of certainty which is generally regarded as the core of the idea of interest. Interest in this sense is called *explicit* interest.

Economists have distinguished *implicit* interest also. This term is used to cover those cases where the owner of capital employs his funds personally and hence enters into no contract for payments to a second party. It is assumed that the employment of capital by its owners will result in gain and that if such gain were not in prospect the funds would be loaned to others at interest in the regular way. The idea of implicit interest has been extended to the share accruing to stockholders of corporations. Investments are made in corporate undertakings and evidenced by certificates of ownership. The prospect of return on these certificates may also be implicit interest.

As long as the return to capital employed by proprietors privately, or through the corporate form of organization, is certain, the analogy to explicit interest is permissible. But since there is no contract with other parties, who promise to pay, and therefore no legal sanction in these cases, certainty of return must be assured before it can fairly be called interest. Other than legal means of assuring certainty are regularly employed. The basic soundness of a given enterprise itself is the true foundation of certainty, after all, the law merely takes precaution to add its sanction to economic certainty. Legal promises unsupported by sound economic values are little better than mockery. Moreover, the character and integrity of the borrower himself often inspire greater confidence than paper promises which require expensive litigation to enforce and with the result too often in doubt. Certainty, however secured, is the indispensable characteristic of interest, whether implicit or explicit.

But the quality of certainty alone is not sufficient to describe fully what interest means to the investing public today. To certainty we must add regularity and fixity. Interest implies a fixed amount of income, payments on which take place at regular stated periods. The loan contract exemplifies these characteristics best. The amount of the interest and the dates upon which it is to be paid appear in the contract. Fixity, regularity, and certainty, then, are the attributes of modern interest, just as their antonyms variability, irregularity, and uncertainty are the attributes of profits.

Gross and Net Interest.—Gross and net interest correspond to gross and net return on capital. Money invested at interest incurs certain expenses and trouble, for which allowance must be made in estimating the net interest. A price is also paid for the quality of marketability. The disadvantages represented by expenses and trouble and poor marketability must be deducted from the gross interest received—that is, the rate named in the contract or received on proprietorship investments—in order to arrive at the net interest.

Pure Interest and Risk-interest.—Net interest may be said to be *pure* interest, provided the investment is of the riskless sort. But where risk is assumed by the investor, the term “net interest” includes compensation for the possibility of loss. This additional increment has been called “risk-interest” and, after the analogy of insurance, represents a premium demanded by the investor to cover the possibility of loss on his investment. If accurately calculated, premiums will exactly offset losses and nothing in addition to pure interest remains. This result takes place, however, only when the funds of the investor are large and scattered among many different issues so that the gains through the premiums on many issues will exactly offset the losses on a few. Risk-interest, however, may actually add to one’s income in case one holds only the lucky issues. It is equally true that severe losses may be sustained if one holds only the unlucky issues. For the institutional investor possessing large funds and holding numerous issues, the actuarial principle admits of no gains from risk-interest. This, nevertheless, is not to say that no gain can come from investing in risk-bearing securities. Gains often do come in this way, provided investments are made whose yields overvalue the premium necessary to carry the risk involved. This occurs when the realized gains are larger than the calculations made beforehand as expressed in the market place.

Pure interest is at best a theoretical concept only. No investment can be found which will serve as an example of pure interest. The rate finally accepted by the investor is the result of calculations of the difference between gross and net interest, a sort of loading, carried by the investment as well as adjustments for individual sentiment and preferences. For purposes of illustrating pure interest, the government loan

is usually chosen. But government loans themselves are affected by various modifying conditions. For instance, United States Government bonds are to a certain extent non-taxable, while corporation bonds are heavily taxed. This creates an abnormal demand for the former and a restricted demand for the latter. Government bonds too are frequently affected by patriotic appeal as were Liberty bonds during the war. Yet in spite of these conditions Liberty bonds perhaps came closer to yielding pure interest than any other type of investment.

Theories of Interest.—Interest has been paid for the use of money in all civilized ages. It was common in ancient Greece and Rome but philosophers of the time were hostile to the idea. Aristotle speaks of the barrenness of money and hence the unjustness of the interest charge. The early Church Fathers were equally hostile to the loan sharks and it was not until the invention of subterfuges that canon law of the Middle Ages tolerated interest. The canonists finally explained interest on the ground of damage resulting to the lender of money if not paid upon the stipulated date (*damnum emergens*). Later was added the principle of cessation of profit to the lender who parted with his funds (*lucrum cessans*).

Since the development of the science of political economy, interest has generally been approached from the side either of demand or of supply or through a combination of the two. Most theories which have gained favor among political economists may be designated as supply theories, demand theories, or equilibrium theories.

Productivity Theory—Of those who approach the subject through the demand side, the most important group is the productivity school, which holds that interest is due to the productivity of capital and the rate is the measure of productivity or of marginal productivity. Professor J. B. Clark was the chief exponent of this school of thought. This theory seems to be reasonable enough if attention is confined to producers' demand and emphasis is placed upon hope rather than upon realization. In addition, producers doubtless set a lower limit to the rate of interest they are willing to pay and make calculations so as to leave a margin of profit to them after the payment of interest. Otherwise there would be no sufficient motive in borrowing. Is it not the margin of profit between the return expected from the use of capital and the rate of interest offered that provides the necessary motive in borrowing for productive purposes? However that may be, the productivity, or usefulness, of capital which results in an excess of goods being produced over empty-handed production constitutes the source of funds out of which producers are enabled to pay interest.

Exchange Theory—Writers who have approached the problem of interest from the standpoint of supply have found the explanation of the rate in some aspect of the causes and motives in saving. The leader of

this group was Bohm-Bawerk, the eminent Austrian economist. He found the fundamental explanation of the rate of interest in the general estimation which individuals placed upon the value of present goods with reference to their value in the future for consumption purposes. This finds concrete expression in the statement that the future is underestimated with reference to the present. With the rate of interest assumed to be 6 per cent, consumption goods now worth \$100 are valued at only \$94 for use a year hence, at \$88, 2 years hence, and so forth. In order to induce saving, therefore, a premium of 6 per cent, or \$106 a year hence, \$112 two years hence, and so on, must be offered for \$100 at the present time. This theory, called the "exchange theory," has been amended by Professor Carver. As stated by him it is not the general estimation of the present with reference to the future, but it is the estimation one places on the marginal instalment of savings. It then becomes a matter of the present and future estimation of the last increments saved. The estimation of the present and the future value of the marginal instalment of savings has been spoken of as the "time-preference" theory of interest by Professor Fetter and has received its most detailed elaboration at the hands of Prof. Irving Fisher as the "impatience" theory.

The exchange theory of interest has a sound basis in private consumption loans. Borrowers and lenders merely bargain on the basis of present and future marginal values of consumers' goods. Even here it may be pointed out that capitalists of importance never actually consume their capital but are more interested in accumulation. The situation seems to fit better the small- and medium-class savers, to whom problems of consumption are especially important.

The Equilibrium Theory.—But most of the text books on general economics are satisfied with neither the productivity nor the exchange theory of interest standing alone. They rather center their attention upon the equilibrium established by the bargaining of marginal savers with marginal producers. Professor Alfred Marshall illustrates this by comparing the two sides of the equation with the two blades of a pair of scissors, both edges of which are cutting. The point of contact represents the position of the marginal savers and marginal producers. This analysis is analogous to the equilibrium of the marginal cost of production and marginal utility of consumers in the determination of the value of consumers' goods. It seems to represent the logical conclusion of both the supply and demand theories, since it recognizes the influence of both the borrower and the lender.

Supply and Demand.—But the problem of interest can best be approached through the broad operation of the forces of supply and demand in their totality. These economic forces, wherever operative, are continually seeking equilibrium between buyers and sellers. Their operation is not confined to a restricted marginal few as is implied in the

theories briefly recited above. The entire scope of supply and demand must be brought into play. The productivity theory neglects the influence of infra-marginal producers and also the demand for consumption loans from private borrowers and governmental organizations. The former, embracing capital going into dwelling and apartment houses, instalment buying, and so forth, bulk large in the total demand for funds, while government borrowing is a factor of continuous importance. The exchange theory, on the other hand, neglects all savings except those employed in consumption loans. The latter constitute only a fraction of the total supply of capital, most of which originates in corporate surpluses and among the well-to-do classes of individual savers. In fact, the marginal savers and demanders themselves receive their precise location through the effective influence of others located in the infra-marginal regions. It is, therefore, demand and supply in their totality that seek equilibrium and determine the area within which marginal bargainers operate. The influence of the latter is mechanical in nature and final, or exact, adjustments of equilibrium seem to be their peculiar function.

Interest the Price of Capital Funds—One takes it, then, that the interest rate is determined by the operation or the forces of demand and supply in their totality. Back of supply and demand lie the various forces and motives which have been noticed in Chaps. III and IV. These, for the most part, have to do with the conditions of the accumulation and employment of capital and are determined independently of the precise rate of interest, although some mutuality of influence is present. The problem in the main is the establishment of equilibrium between a fairly constant supply on the one hand and a variable demand on the other. This equilibrium is brought about through the economic institution of price. The rate of interest is merely the price of capital funds. In this respect it is like the price of anything else in the realm of economics. The problem of interest rates thus becomes a special case of value. This conclusion has the authority of writers on finance and practical economics and offers a reasonable explanation of the precise interest rate established in the capital market.

Current Demand and Supply Alone Effective—The rate of interest is directly the result of the supply of and demand for current funds only. The old capital accumulations exercise an uncertain influence on the immediate rate. Funds once invested in an enterprise are generally irrevocably committed for good or bad. The stream of investment funds constantly coming on the market is bid for by all who have use for capital, and the bids are governed largely by the size of the stream and the intensity of demand. Individuals desire to extend business operations with the hope of greater profits; promoters desire to try out schemes for getting rich quick, the farmer desires to try his luck with the coming

season, a municipality decides to pave a street or build a museum; a state votes a soldiers' bonus bill or appropriates money for the construction of a highway, the national government plunges into a foreign war or builds the Panama Canal, all enter the market, each bidding against the other for investment funds. The strength of the bids, the intensity of the desires, determines the rate which any or all are willing to pay. Some may indeed go away unsatisfied, but this is the result of the lack of effective desire at the competitive price which the funds command. It is the same as in the case of every competitive valuation in the market. Some would pay even more than the price obtained, while others fall out of bidding before the final price is established.

The conception of the current supply and demand, however, must not be too narrowly conceived. Current supply and demand are not synonymous with fresh supply and demand. In the securities markets there is always what is called the "floating supply." This must be added to the new capital flotations in order to obtain the total current demand for funds as expressed by securities seeking a market. On the other hand, funds invested in the past are constantly being recovered through the process of amortization of capital and these similarly must be added to the fresh supply of savings to obtain the total current supply.

The chief variation in the forces which determine the interest rate is found in changing needs for capital funds. There are primary and secondary movements in the interest rate. For example, following the panic of 1873 with its high interest rates, there occurred a primary movement downward, manifesting itself in a gradual decline for a period of more than 20 years. Following that came the period from the later nineties down to the present day which has shown a steady rise in the interest rate. The demand for funds for public expenditure has been a major force during the past 20 years over against a relatively fixed supply of funds. Secondary movements occur at shorter intervals. The steady rise of the rate after 1900 was interrupted by a reverse movement during the years following the panics of 1903 and 1907, owing to their disturbance of business. The recent development of the electrical industries, the public utilities which to a large extent depend upon the electrical business, the exploitation of the automobile business, and so forth, are responsible for a greatly increased demand for investment funds and a rise in the rate of interest. Capital funds have also been demanded during critical years in industry, when business and earnings are poor, in order to tide over and save business from bankruptcy. It thus happens that during the years of poorest earnings and threatened failure the interest rate soars to its highest points. At such times, it is not the increase in productivity of capital which sends the rate skyward, but it is merely a question of survival and without any definite assurance whatever with regard to the future.

The influence of demand may be specially observed in short periods of rising commodity prices. The period 1905-1907 and the recent war period are good examples. Rising commodity prices stimulate business expansion, so that the demand for investment funds increases rapidly, forcing the rate of interest far above the normal level. The process brings its own cure in the end. Rising costs of labor and materials, and high interest rates soon absorb anticipated profits, and the current of demand slackens. Except for meeting urgent obligations, borrowing would soon fall off under these circumstances.

The relative influence exerted through the different sources of demand depends upon the relative amount demanded by each group. This changes from time to time. During a great war the demands of the government for funds are so great that they render scarce funds available for other purposes, for this reason they exercise a dominating influence on the rate, invariably causing it to rise. In other periods, for instance that just preceding the World War, the Government of the United States was almost a negligible factor in the market for new investment funds. The demand from state and municipal governments, however, was great, and, although not exercising a dominant influence, nevertheless it did appreciably affect the rate. Again, the demand for capital for productive purposes is probably the most continuous and in normal times the largest and, therefore, the greatest influence. Cyclical changes in business, however, bring changes of 2 per cent or more. The foreign demand frequently is of such importance that it affects the rate of interest. In short, the dominating influence on the demand side is now one group of demanders and now another. It matters not what the source of demand is, the quantity of demand over against the available supply of current investment funds fixes the rate of interest at any particular time.

The general reasoning applied to the problem of interest will apply also to the problem of profits. Corporation finance presents stocks and bonds with all degrees of risk attached to them. Some bonds are regarded as undoubtedly safe for an indefinite time in the future. The circumstances surrounding their issue are such as to satisfy the most fastidious. These are the issues that were especially in mind in the discussion of the interest problem. The return to the investor approaches pure interest. The entire earnings and properties are commonly pledged as security. The combined productive capacity of all the factors within an establishment have been pledged to make these issues secure. Indeed, only by such guarantees can a high degree of safety be obtained in corporation bonds.

But by guaranteeing the senior issues of corporations by the pledge of greater property equities and the entire earnings, junior issues have been weakened in proportion. The claims of stocks and debenture bonds must give place to mortgage bonds. The former, therefore, bear the main risks of business enterprise. What determines the rate of return

on these issues? It is, again, the competitive bidding for funds which are to bear the risks involved. Naturally this results in a higher return than can be secured on safe investments. The price will settle at the point where the return expected will offset the risk assumed. The price of funds for speculative commitments is determined, therefore, by the balancing of the forces of supply and demand regulated according to the risk involved in each particular case.

The Supply of Money and the Interest Rate.—The relation of money to the interest rate is frequently a stumbling block. It is often claimed that with an increase in the supply of money comes a decrease in the rate of interest, and, when money is scarce, there is a correspondingly high rate. This claim deserves to be examined with some care.

Economists have long claimed that in the long run the amount of money in circulation has nothing to do with the interest rate. This is based on the fact that money in itself is of no service except only as a medium of exchange. The amount of money in circulation indeed affects prices in proportion to its quantity, other things remaining the same: an increase in the amount of money in circulation will be attended with a corresponding rise in prices, a decrease in the amount in circulation will be attended with a proportionate fall in prices. The price level, however, is immaterial since the things really desired are commodities and services. The rate of interest, being the price of capital funds, simply represents a certain percentage of a given value. If money is abundant, value will be expressed in relatively high prices, and when money is scarce, the reverse will be true. In neither case will the alteration in the amount of money affect the value of commodities and services, no matter what the price is, the rate of interest will always represent a definite percentage of the value.

How does the matter stand from the more immediate point of view? Sudden changes in the supply of money of a country are often observed. The period of the World War is the best illustration of this when the net addition to the supply of gold in the United States amounted to something like \$1,000,000,000. This served as a new basis for bank credit. It was this inflow of new gold and its more efficient employment as reserves under the new Federal Reserve Banking System that brought about the unexampled expansion of credit and currency. Although money became more and more abundant during this period, it was accompanied by a constant rise in the interest rate. Since the armistice, the supply of money has continued to increase, but there has been a decided fall in the interest rate. The high interest rates of the last half of the year 1920 and the first half of 1921 were due to business stress. By the end of 1921, liquidation had gone far enough to place the banking system in a strong position again, this caused a lowering of the bank rate because the system was strong and the reserves were ample.

This is the usual situation after every period of stringency when banks force liquidation of weak debtors in order to strengthen their own position. Such a period is invariably accompanied by a period of accumulation of deposits by the public which represent potential investment funds. On account of the fact that most people withhold their funds waiting for more favorable investment opportunities, the rate of interest commanded by new capital issues remains higher than the bank rate. This phenomenon showed itself throughout the greater part of 1921. The interest rate in each case is governed by the temporary balance between the demand for particular kinds of funds and the supply of these funds. It may be concluded, therefore, that the rapid increase in the amount of money and credit in periods of transition from one price level to another, periods too short to allow complete adjustment in the price level, affect the interest rate through the rise in commodity prices by creating an abnormal demand for funds for the expansion of business. The succeeding period of declining prices is accompanied by a relatively large amount of investment funds and falling interest rates.

Market Rates of Interest—It might be concluded from the preceding discussion that there is only one interest rate. As a matter of fact, there are many such rates. The circumstances surrounding the demand for and supply of funds for different purposes produces a rate peculiar to each case. From the standpoint of safety, all of the rates may be regarded as pure interest. Interest rates may be best treated by dividing them into two groups: rates charged by banking institutions and rates on investment issues. The first need only brief treatment, while the discussion of investment rates is reserved for the succeeding chapter.

Line-of-credit loans are the most common type of loans in American banks. They consist of loans made to merchants, manufacturers, traders, and the like, for productive purposes. They are usually divided into (1) 30- to 60-day loans and (2) 4- to 6-month loans. The 4- to 6-month loans sometimes show a tendency to bear a higher rate than the shorter loans merely because, from the banker's point of view, they are less liquid. Many large concerns whose credit is widely known borrow through note brokers. These loans are referred to as commercial paper. This paper has a broad market and, on account of the certainty of payment at maturity, bears a lesser rate of interest than line-of-credit loans. The same tendency with respect to the time element is observable here as in the case of line-of-credit loans. Another class of loans, recently assuming considerable importance, is that represented by bankers' acceptances. Bankers' acceptances are obligations of banks assumed for their customers who in turn agree to reimburse them at the maturity of the loan. Bank credit is better known than business credit, and, as a result, its paper commands a less rate than either of the other kinds. Maturity is usually from 30 to 90 days.

The loans just referred to may in a general way be called commercial loans inasmuch as they are employed for productive purposes and are presumably secured by stocks of goods, raw materials, supplies, and so forth. Banks also loan heavily upon stocks and bonds as collateral. Little can be said with certainty about the rate on this type of loan. The practice varies widely. With banks located in metropolitan districts, commercial paper is frequently popular and shows a high degree of liquidity and so bears a correspondingly low rate of interest. Most interior banks, however, consider such loans undesirable and demand a higher rate of interest. Stock exchange loans are collateral loans. Money is loaned on the New York Stock Exchange on call, that is, for no definite period of time. Call loans may be terminated by either the borrower or lender on 24 hours' notice. Since they may be terminated at will, call loans show daily changes in rates. The renewal rate is posted at the stock exchange at the beginning of business each morning, and all outstanding loans are renewed for the day at the renewal rate. Should funds become scarce or abundant during the course of the day, additional loans made will vary from the rate established at the beginning of the day. They will be renewed, however, at the beginning of the following day at the renewal rate. The rate on call loans varies more than any other bank rates. This is because only the surplus funds of banks are employed for this purpose, and the rate will vary according to the temporary conditions of supply and demand. Time loans are also made on the stock exchange with stocks and bonds as collateral, but they are similar to the ordinary collateral loans in all essential respects.

Bond Yields.—The interest rates on securities show the same difference as bank interest rates. They may be viewed from any one of the various classifications available. Here is presented the Standard Statistics classification into industrial, railroad, utility, and municipal bonds. In January, 1931, the average yield on bonds of these descriptions was as follows:

Industrials	4 99	Municipals	3 92
Railroads	4 25	All others	4 43
Utilities	4 56		

One might also quote the yield on foreign corporate and government bonds, South American bonds, Canadian bonds, United States Government bonds, and so forth. Another basis of classification is quality. Each of the classes of high-, medium-, and low-grade railroad bonds would show materially different yields. The process of classification and sub-classification may be carried out almost indefinitely, since the market furnishes an endless variety of bonds differing in some respect from one another but possessing other similar characteristics.

When viewed as a whole, the differences in yield on bonds are partly a matter of quality of the bonds themselves, partly a matter of the peculiar-

ity of the market, and partly a matter of the familiarity of the investing public with the class concerned. Each class should receive special study to determine its peculiar position in the relation of its yield to that of other classes of bonds.

Theories of Profit¹—The share of profits in distribution was the latest to receive detailed attention at the hands of economists. The theory of profit, however, was a matter of some discussion already in the theories of the early classical economists. Adam Smith spoke of the "profits of stock," meaning, by the latter terms, stocks of goods. To him profits accrued to the owner-manager of business and represented what was left for capital after deducting wages of management. Profits thus included what economists are apt to call implicit interest on capital. Some reference was also made to the risk element in profit in the sense of loss to capital, but this was not clearly distinguished from interest. John Stuart Mill distinguished the profits of *entrepreneurs* from ordinary wages and recognized interest as a distinct element. Like his predecessors, however, he included interest in profits. This has been the habit also in the writings of later classical economists. But Bagehot in England and Walker in the United States opposed the mingling of interest and profit in the same category.

In France, J. B. Say separated profit from interest and attributed the former to the efforts of the management—hence it was regarded as a form of wages. In Germany, Thünen defined profit as what was left after deducting payments for interest, wages of management, and insurance. Profits were composed of two elements, first came payment for risk, especially of changes in values and the chance of failure of the enterprise, both of which are incapable of being insured, second, compensation for extraordinary effort of the management in planning business, the product of "sleepless nights."

In the days when the amount of capital was small and employed by its owner, it was more or less natural to regard the residual share after paying all expenses and wages of management merely as the profits of capital. But when the accumulation of capital on a large scale became a fact and the managerial function was separated from the ownership of capital, attention was henceforth directed to the special part played by the managers of industry. Business ability then began to assume an important role in the theory of profits. This was given great emphasis in the writings of Gen. Francis A. Walker, who conceived business ability as analogous to land with its varying degrees of fertility. Profits were due to differences in ability of the management which enabled some to secure a return above that secured by ordinary men. This treatment of the matter naturally looks upon profits simply as a differential wage for superior management.

¹ A brief historical account of the theory of profits is found in F. H. Knight, *Risk, Uncertainty and Profit*, Chap. II.

Professor J B Clark developed the dynamic theory of profits. The other shares in distribution, namely, rent, interest, and wages, are the result of prior calculation and may be predicted with a degree of certainty. In the static state these three functions account for all income. On the other hand, profits result from changes in industry resulting from new inventions, discoveries, and so forth, which alter the technique of production and create extraordinary income. Profits thus arising, however, are temporary in nature and, with the adjustment of industry through competition to the new situations, profits disappear. But the continuity of progress is ever creating new profits. This theory of profit may be criticised from the fact that it makes no allowance for dynamic income which is subject to calculation beforehand and which, therefore, falls in the class of insurance risks. It allows only for risks of an unpredictable kind against which no insurance can be provided. Dynamic changes which can be foreseen are always discounted in advance.

F B Hawley has contended that profits are to be explained exclusively on the ground of the risk and responsibilities taken by the *entrepreneurs* themselves. Profits with Hawley, as also with Clark, are residual in character but are always uncertain. With Clark, profits are a species of monopoly gain. But one may be reminded again that income for which insurance may be secured is not the special reward of the *entrepreneur* in business but is a matter of calculation of the insurer, whose reward is the difference between premiums and losses. While distinguishing the insurable or actuarial risk from the risk depending upon mere chance, Hawley fails to draw the logical conclusion to which this distinction leads. His strong point is the insistence upon risk as a factor inseparable from the ownership, hence profits are in part at least reward to capitalists for risking their capital.

Elements in Profits.—The elements necessary to a theory of profits have been distinguished in the theories above discussed. First, before consideration of the amount available for profits, pure interest must be deducted for the use of capital and the ordinary wages of management for the services of the *entrepreneur*. The residual amount may be divided into the following divisions: (a) risk-interest, (b) profits resulting from changes of an unpredictable kinds, and (c) profits due to exceptional ability of management.

As has already been explained, risk-interest is a premium required on insurable risks. Where business and financial organization has proceeded far enough, this is subjected to actuarial calculation and profits normally disappear. But where the individual must assume the risk in business or finance without the benefit of the actuarial principle that comes with assumption of large numbers of individual risks, the result depends upon the ability to select the favorable risks. Where success is attained in this, profits accrue to the management and are the result of *entrepreneurial* ability.

But risks of the unpredictable kind are at best a matter of uncertainty and subject to no actuarial calculation. In such instances foreknowledge is impossible even to the most intelligent and skilful. The profits and losses from this source are largely accidental, the result of chance pure and simple. These are the fortuitous profits spoken of by some writers. They are undoubtedly large in amount as also are the losses from the same sources and one can never have any assurance that a given case will yield a profit rather than a loss. The results here depend upon dynamic changes in industry which are unforeseen and come largely from new invention or discoveries, or from disturbances in world economic conditions, fundamental changes in demand, and other changes of similar character.

In any explanation of business profits, room must be left for sheer executive ability in the successful conduct of business. This shows itself in the ability to operate the plant at reduced cost, the development of new products, the maintenance of high morale among employees, and so forth. It would seem that income due to superior management should be classed as wages and there is theoretical support for this position. But in the modern organization of industry with the separation of managers from the ownership of capital, the reward to the stockholders is doubtless materially affected by the ability of the management. This results from the imperfect working of economic laws in a complex business organization. The effective influence of competition stops short of securing for management what seems clearly to be its special product.

Nor should the influence of monopolistic elements in business and finance be omitted from the sources of profits. These result partly from naturally monopolistic forces and partly from patent rights and copyrights secured by law. They result also commonly from the modern organization of industry into large aggregations of producing units, which effectively shut out competition, and from acquired reputation and good-will.

Investment Significance of Interest and Profit.—The general theories of interest and profit may be easily utilized in finance. Financial methods and instruments are based upon the underlying foundation of the business and financial structure. The market affords large classes of securities that may for practical purposes be regarded as riskless and whose income falls within the class of pure interest after making the deductions before noticed. Other large classes of securities are available which carry premiums as compensation for insurable risk. If these are combined so as to secure the benefits of diversification and if good judgment is exercised, a profit may accrue. Likewise, the individual investor whose funds are large enough to secure a measure of diversification may by superior judgment reap material rewards above the pure interest rate.

The opportunity of securing profits in investment issues is abundantly offered. For those who hold the lucky issues, fortuitous profits accrue as a reward for the risk assumed. Selection of superior management in business is a prolific source of profits to those endowed with wisdom and patience. Much the same may be said in case of monopolistic profits. These may be recognized by the shrewd investor and advantage taken of favorable situations.

Speculative Profits.—Dissociated from the business and financial structure itself is the opportunity for speculative profits of the type in mind when the matter of speculation was under consideration.¹ Profits from this source are typically made from price movements in the financial market. This introduces another element of risk entirely separate and independent of the types above discussed. We shall in another connection name this risk the market risk. In Part V the reasons for fluctuations in market prices of securities are taken up. These movements of the averages are to a large extent the result of general business and financial changes and are not primarily associated with any particular enterprise. They are predominantly financial, or monetary, in character. Speculative profits resulting from changes in the market price of securities are undoubtedly among the most prolific sources of gains and bulk large in the totality of profits. Likewise losses from this source reach large proportions. But speculators are not the only ones who profit from this source. Investors in stocks and bonds alike frequently find themselves the recipients of such fortuitous profits. Perhaps equally often they find themselves the victims of adverse price movements. Whether he wills it or not, the security holder is subject to market uncertainties.

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¹ See Chap. I.

CHAPTER VII

VALUE, PRICE, AND YIELD

One may begin the subject of value and price by recalling that the essential nature of investment is the purchase of future incomes. The word "purchase," however, is used in a special sense. Ordinarily it means the exchange of money for goods. But in this case present money is exchanged for future money and no goods are directly involved in the transaction. Nor does the purchaser of income in the investment market irrevocably part with his funds. He surrenders his capital for the time being, that is, he allows others the use of it for a period of time, upon consideration of receiving in the interval compensation in the form of a return on the investment, always with the express or implied condition that the principal of the investment will be returned at the end of the interval. This is true no matter how long the interval or what the details of the contractual arrangement between the parties may be. Even in the case of the annuity, if allowance be made for the hazard of life in individual cases, the principal is returned in the periodic payments.

Present Value of Future Income—If one views investment as the purchase of future incomes with the recovery of the principal implied, the question of security values is that of the present value of future income itself. The question is then always, what will one pay for a future income? The preliminary answer to this is that future incomes are valued on the basis of the amount of future income purchased, its regularity, and its certainty. The simplest case is that of a single year's time. Assume the case of a 1-year investment paying \$6 certain at the expiration of the year. The current price paid in this case represents the present value of the future income of \$6, plus the present value of the amount of the principal to be recovered at the end of the year. Suppose the current interest rate to be 6 per cent and the principal payment 1 year hence to be \$100, the present value of future payment of income and principal would be respectively \$5.660+ and \$94.339, or \$100 in all (fractions disregarded).

When the interval is longer than 1 year, principal and interest payments must be discounted for the entire interval at the current rate and according to the usual custom on the principle of compound interest compounded annually. In case of a 2-year interval, the present value of the payment at the end of the first year is figured the same as in the above example. The value of the second year's payment would be the

present value of \$6 payable at the end of the second year. Figured on the compound basis, it would be \$5.339, which when added to the present value of the first year's payment gives \$10.999, the total present value of future incomes for 2 years. Likewise, the present value of the principal amount of \$100 payable at the expiration of 2 years is found to be \$88.990. The sum of all of these payments is \$100 (fractions disregarded), which represents the present value of all future payments. It will be observed that the present value of all future payments will be exactly equal to the principal amount of the investment and this would be true no matter how long the interval of calculation. It is in accordance with the economic theory of interest which always finds an equivalent between present sums and present values of future sums. This is the condition of economic equilibrium between present and future amounts. The difference in payments necessary to equalize the current estimates of values between the present and the future is based upon the psychological fact of natural myopic vision. One underestimates the value of things in the future largely because of the necessity of living in the present, and as the future draws nearer values are magnified in proportion.

Irregular Income.—The example above assumes regularity of income payments. This would cover all cases where the income on a bond or stock is fixed at a uniform and definite amount for the entire interval. The same principle (if not the example), however, applies where the income is irregular in character. In some bonds the income for the earlier years is a small amount but is subsequently accelerated until the maximum rate is reached which afterwards remains uniform. Participating features are also frequently added to bonds and preferred and Class A common stocks. Finally there is the case of common stocks whose earnings vary from year to year. In this case the present value of future earnings will vary with the earnings themselves. Since these are uncertain as for any individual year the only feasible procedure is to establish a figure for average future earnings and then base calculations upon this amount.

The Risk Factor.—In the above example certainty of payments was assumed. But such an ideal state does not exist in a majority of the investment issues, using the term investment here as always in its fundamental economic meaning. In valuing future income, the present value is affected in proportion to the risk involved in future payments. The risk factor inherent in most investment situations is taken into account by the addition of a premium to the current rate of pure interest. If pure interest is at the rate of 4 per cent and the risk is small, an additional 1 per cent, or 5 per cent in all, would represent the rate used in discounting future payments to find the present values.

While this reasoning is valuable to the investor, it must not be taken to mean too much. The principle will work on the basis of averages

when a sufficient number of securities of diversified risk are considered. Yet it needs only a moment's reflection to see that the nature of risk itself precludes the possibility of accuracy in case of a security involving a single risk. Failure to meet payments in any security is always possible and the higher rate of discount allowed will compensate for losses where a large number of securities are included in the investment. If estimates of risk are accurate, the final result will show losses exactly compensated for by the premiums and the net amount of income and principal payments will be equivalent to that from riskless investment discounted at the current rate of pure interest.

Taxation.—Where securities bear a definite tax, as under the property tax, the mortgage recording tax, and the like, adjustment must be made in the payments to be made in the future so as to allow for the tax. For instance, a bond of \$1,000, bearing a coupon of \$50 per annum upon which a tax of \$2 has been levied, will give a net return of only \$30 per annum. If the current rate of interest on capital is 5 per cent, the present value of future income payments of \$30, instead of \$50, per annum will be discounted at the rate of 5 per cent in order to find the present value.

The Case of Stocks.—Stocks have been considered in part already but one feature common to most stocks deserves especial consideration. As a rule, stocks are perpetual in character, that is, no redemption provisions are contained in the contract. Here apparently is an anomaly and exception to the usual case, since payment of the principal cannot be discounted since the interval is perpetual. The same difficulty appears in respect to income payments which continue in perpetuity. From the mathematical point of view, present value of payments in the distant future approaches zero but never quite reaches this point.

It should be observed further, however, that the longer the period of duration, the less will be the present value of the future payment of the principal, and the more will the present value of future income payments encroach on the present value of the principal. The logical result is that present values of future income payments approximate the value of the principal invested, while the present value of the latter approaches zero. Thus in the case of perpetual securities the only practical consideration is the income itself. In these cases, mathematical calculation becomes simple. The rule everywhere followed is to capitalize the annual income at the current rate of pure interest plus an amount which would compensate for the risk element, if any. Thus if it is desired to find the present value of a perpetual income of \$8 per year to the holder of a share of stock whose risk factor may be represented by 2 per cent when the pure rate of interest is 5 per cent, one has only to capitalize the \$8 income on a 7 per cent basis by dividing the former by the latter. This gives \$114.28 as the present value of future incomes. And since the income is perpetual, this amount at all times represents the present value of all future

income payments, unless indeed the rate of interest or the risk factor changes

The Common Measure of Value.—For purposes of comparison it is necessary to reduce all investment values to terms of a common measure. This is necessitated from the fact of the great diversity in the amount and character of the income and principal payments and the duration of the investment. Bonds are commonly issued in denominations of \$1,000 or multiples thereof, but there are also many bonds of \$500 denomination, a considerable number of \$100, and even \$50 or \$20 may be found. Until recently, preferred stocks commonly were of \$100 denomination, or face value. Today examples of par value of \$50, \$25, \$10, \$5, or even \$1, are of frequent occurrence. Stocks are now commonly issued without any specific denomination as in case of no-par stocks. Income also varies in the case of common stocks, income bonds, and participating preferred stocks and bonds. To complicate matters still further, securities are of varied duration, ranging from a number of days in cases of notes, or bonds approaching maturity date, to securities of perpetual duration as in the case of stocks. In comparison of values of securities under these varied considerations, we must seek a common denomination, or measure, of value. This is found in what is called the yield to maturity. Just as money constitutes the only common measure of value of all commodities, so yield constitutes the only common measure of value of the heterogeneous mass of securities. A discussion of yields thus becomes essential for an understanding of comparative values.

Nominal Return—Bonds, notes, and preferred stocks bear either a definite rate of return on their face value or a stipulated number of dollars per annum. Thus a 4 per cent bond means the owner is promised 4 per cent annually on the face value of the bond, although this may be divided into semi-annual or quarterly payments. Likewise, a 7 per cent stock means the owner is to receive 7 per cent annually on the face value of the stock which may also be divided into semi-annual or quarterly payments. Some stock is made cumulative, this means that, should the corporation fail to pay the dividend as indicated, the unpaid dividends will accumulate until the earnings are sufficient to pay all amounts in arrears, before anything can be paid on the common. Sometimes there is a participating feature attached to preferred stocks and bonds. This means that under certain specified conditions the corporation will distribute additional earnings to the holders of those issues.

The rate of interest or dividends paid on bonds and stocks as described above is called the nominal rate of return. It is always a certain percentage of the face value, or a definite amount per share in case of no-par stocks. The yield on the investment, on the other hand, is a very different matter. This results from the fact that the purchaser seldom pays exactly par, or the face value, for stocks or bonds. Even when new

issues are being floated, it is customary to dispose of them to investors at a figure somewhat below par. Bank stock is a universal exception to this rule on account of the legal prohibition against issuing shares at any figure below par. Likewise, the State of Massachusetts forbids the issue of stocks of public utilities under par. Railroads and public utilities are also controlled by public authority. No matter what the price at the time of flotation, both stocks and bonds may be sold subsequently by the original owners at any price agreed upon between the parties concerned. It is only accidental, therefore, if a share of stock or bonds sells at exactly par.

The yield upon stocks of limited income is a matter of simple arithmetical calculation. If the share sells at par, the nominal rate of return and that of yield are the same. But if the selling price of a stock with par value of \$100 is \$90, for instance, the nominal rate of return and yield would be different. If this is a 7 per cent stock, \$7 will be paid annually on every share. On the basis of the selling price of \$90, the yield may be easily found by dividing \$7, the nominal return, by \$90, the selling price. The yield is found to be approximately 7.8 per cent on the investment.

Stock-yield tables are based upon \$100 par value and regard the dividend as a percentage of this par value. For stocks whose par value is over or under \$100, the net yield can be found only after adjusting the par value to the \$100 basis and calculating the dividend on a percentage basis. Thus a stock with \$25 par value paying an annual dividend of \$2 becomes for purposes of calculation of yield a stock of \$100 par value with dividend of 8 per cent. For calculation of yield at a market price different from par value, the market price must first be multiplied by 4 and the dividend of \$8 on this amount calculated in terms of percentage. If the par value is \$200 and annual dividend \$16, the tables can be used only after dividing both the par value and the annual return by 2, which reduces the par value to a \$100 basis as in the former case.

For stocks of no par value the tables cannot be used at all. Here the method of simple arithmetic will give a speedy result. The nominal return stated in number of dollars per year is merely divided by the purchase price and the quotient is the net yield. Thus a stock of no par value paying \$3 per year in dividends bought at \$60 will produce a yield of 5 per cent. The method of simple division is also readily employed for stocks of par value other than \$100.

The method of calculation for stocks above indicated is universally used, although the custom of paying dividends on the quarterly basis renders them somewhat inaccurate. The tables, as also the method of simple arithmetic, assume dividends are paid only at the end of the year for the entire year. Obviously the payment of quarterly dividends advances three-fourths of the annual payments by one, two, and three quarters. Dividends thus received may be reinvested and made to pro-

duce an additional income. The tables thus understate the yield on stocks. But few are so meticulous that the calculation on the annual basis will not satisfy.

The method of calculating yields on stocks is also employed in the case of perpetual bonds. Examples of this class are the 5 per cent domestic loan of the Republic of Cuba and British Consols. Bonds of long duration may be figured in this manner also with only a small margin of error.

Bond Yields—As a rule, bonds are paid at their face value at maturity. This necessitates adjustment for premium or discount from par in the purchase price. It raises the question as to what portion of the total coupon and principal payment at maturity the holder is entitled to count as interest and what is merely repayment of principal. The net yield takes account only of that portion of these payments that represents income. Since the market price of a bond is seldom exactly par, the bond will be bought generally at a premium or discount. As the bond approaches maturity, the price will also approach the face value. Since bond yields in accountancy are always figured on a cost price to the owner and the yield for a particular bond always remains constant throughout the lifetime of the issue, the amount of the premium or discount must be amortized by the time the bond matures. The net income, therefore, is decreased or increased by the amount of the premium or discount. The amount of the discount is sometimes spoken of as appreciation and the amount of the premium as depreciation. These designations are both erroneous.

In the case of bonds bought at a premium, proportionate deduction is made from the income payments to amortize the premium; in case the bond is bought at a discount, the excess payment at maturity over the price paid for the bond represents income. In the mathematics of yield, account is taken of this situation. For example, a bond of \$100 denomination due at the end of 20 years, although purchased at, say, \$90, will be redeemed at maturity at \$100, or par value. The purchaser, while receiving the regular interest payments as they fall due, will at the end of 20 years receive in addition \$10 more than the original purchase price. This, in all probability, enters into the calculation at the time of purchase and must be considered as part of the compensation to the investor. The method of figuring the exact yield in such cases involves a complicated mathematical process about which the investor is not concerned. The process of calculation is so long and arduous that elaborate bond tables have been constructed which will enable one to find immediately the desired yield. A four-place bond table is commonly used which is accurate within 1 cent on a \$100 bond, on the basis of 20 years' duration. For larger amounts, bankers ordinarily use extended tables of eight-place decimals which are accurate within 1 cent on the \$1,000,000. Accurate

tables have been prepared by Montgomery Rollins in his *Bond, Stock, and Interest Tables*. A portion of the 20-year bond table is illustrated in Table 25

TABLE 25 — PORTION OF 20-YEAR BOND TABLE

Percentage of annual yield	4 per cent	4½ per cent	5 per cent	5½ per cent	6 per cent
4	100 00	106 84	113 68	120 52	127 36
4 10	98 64	105 42	112 20	118 98	125 76
4 20	97 31	104 03	110 75	117 47	124 19
4 30	96 00	102 66	109 33	115 99	122 65
4 40	94 72	101 32	107 93	114 53	121 14
4 50	93 45	100 00	106 55	113 10	119 65
4 60	92 21	98 70	105 19	111 69	118 18
4 70	90 99	97 43	103 86	110 30	116 74
4 80	89 79	96 17	102 55	108 94	115 32
4 90	88 61	94 94	101 27	107 60	113 92
5	87 45	93 72	100 00	106 28	112 55
5 10	86 31	92 53	98 76	104 98	111 20
5 20	85 19	91 36	97 53	103 70	109 87
5 30	84 09	90 21	96 33	102 45	108 57
5 40	83 01	89 07	95 14	101 21	107 28
5 50	81 94	87 96	93 98	100 00	106 02
5 60	80 90	86 87	92 84	98 81	104 78
5 70	79 87	85 79	91 71	97 63	103 55
5 80	78 86	84 73	90 60	96 48	102 35
5 90	77 86	83 69	89 51	95 34	101 17
6	76 89	82 66	88 44	94 22	100 00
6 10	75 92	81 66	87 39	93 12	98 85
6 20	74 98	80 67	86 35	92 04	97 73
6 30	74 05	79 69	85 33	90 97	96 62
6 40	73 14	78 73	84 33	89 93	95 52
6 50	72 24	77 79	83 34	88 90	94 45
6 60	71 36	76 86	82 37	87 88	93 39
6 70	70 49	75 95	81 42	86 88	92 35
6 80	69 63	75 06	80 48	85 90	91 32
6 90	68 79	74 17	79 55	84 93	90 32

To illustrate the use of the tables, take a bond purchased at \$96 33 due in 20 years and bearing 5 per cent nominal rate of return. From the nominal rates given horizontally across the top of the 20-year table, select the column bearing 5 per cent. Follow down the column until the figure representing the purchase price is reached, then proceed horizon-

tally to the left to the column marked "per cent per annum," where 5 30 appears. This is the annual yield on the bond, provided it is held to maturity.

Interpolation—The exact purchase price of bonds, however, is seldom found in the tables. This will necessitate the process of interpolation. Suppose the price of the bond in the illustration was \$96 50. This figure does not appear in the table. It lies between the figures 96 33 with a yield of 5 30, and 97 53 with a yield of 5 20. The yield, therefore, lies between 5 30 and 5 20. The simplest method of calculating the yield is as follows: 96 50 subtracted from 97 53 leaves 1 03; 96 33 subtracted from 96 50 leaves 0 17. This gives a difference between the prices above and below the purchase price of 1 20, the sum of 1 03 and 0 17. The difference between the yields, 5 30 and 5 20, is 0 10 which is to be compared with the difference of 1 20 in the prices. The price comes nearer to the yield of 5 30 than 5 20, therefore, something will have to be deducted from the 5 30 to get the desired result. The following proportion will give the amount to be deducted: $0 17 : 1 20 :: x : 0 10$. Solving the equation, x equals 0 01, which deducted from 5 30 gives 5 29 as the yield sought at the purchase price of \$96 50.

Sometimes it is desired to purchase bonds at a price to yield a definite percentage. For example, suppose it is desired to purchase a \$100 bond maturing in 20 years with nominal interest at 6 per cent so as to yield 5 08 per cent to maturity. This figure falls between 5 and 5 10 in the yield column of the table. Subtracting 5. from 5 10 the result is 0 10. The difference between the prices in the table at these two yields, that is, the difference between \$112 55 and \$111 20, is \$1 35. The yield on \$1 35 for the period for 6 per cent is 0 10 per cent. The difference between the desired yield of 5 08 and 5 10 is 0 02, while the difference between 5 08 and 5 is 0 08. The yield 5 08 is nearer to 5 10 than to 5. The proportion then would stand $0 02 : 0 10 :: x : 1 35$. Solving the equation, x equals \$0 27. This amount added to \$111 20 gives \$111.47, the price which would yield 5 08 to maturity.

Interest Interval.—The interest interval affects the yield on bonds. The customary period is 6 months and the bond tables are constructed on this basis. But government bonds in particular pay interest quarterly, in which case tables adapted to this interval should be used. If no such tables are available, conversion tables are sometimes used which reduce the results obtained on a semi-annual basis to a quarterly basis. The quarterly basis requires a less amount to be set aside for the amortization fund and thus increases the yield in the case of the premium bond and decreases it in case of the discount bond.

Interest Rate on the Amortization Fund—The fund set aside for the amortization of premium or discount is compounded on the dates when the bond interest falls due. This fund is compounded semi-annually,

since opportunity is afforded of investing it in savings banks, or in other ways, compounded on a semi-annual basis.

The interest rate on the amortization fund is figured on the same yield basis as the net yield of the bond. A moment's reflection will raise the question of the appropriateness of using this rate for the amortization fund. Bonds are frequently bought on a higher yield basis than savings institutions allow on their deposits. The fund, therefore, will generally be inadequate for amortization purposes and the net yield on the investment will be greater in the case of the premium bond and less in the case of the discount bond than the tables show. Why then should the interest rate on the fund be the same as the net yield on the bond? The answer is that if tables are to be of universal use some interest rate must be selected and no better figure can be found for universal use than the current interest rate on money invested in the manner represented by the bonds in question. No stronger case can be made for any other interest rate.

Market Quotations—Most bonds sell over the stock exchange at the price agreed upon plus interest. This means the purchaser pays in addition to the price mentioned an amount equal to the interest accrued from the last interest date to the date of the delivery of the bond. For example, a 6 per cent bond purchased on August 1, at \$100, or par, with interest payable semi-annually, say, January 1 and July 1, would have 1 month's interest accrued. The semi-annual payment is \$3, and 1 month's interest would amount to one-sixth of \$3, or \$0.50. The cost of the bond would then be \$100.50. The investor, however, in his own accounting, considers the amount paid for accrued interest as deductible from the payment on the following interest date, thereby regarding only the \$100 as the permanent investment. Interest tables are available, so that separate calculations for each transaction are rendered unnecessary. Bonds in default, income, and adjustment bonds, owing to the uncertainty of the interest payments, are dealt in "flat," that is, without any consideration for accrued interest. The same is true of preferred and common stocks.

In the case of preferred and common stocks occur three dates of importance to the investor. Since the power of the declaration of dividends lies with the board of directors, the dividend meeting dates are important, especially if there is any question about a change in the rate or an extra dividend. Also, dividends are made payable to stockholders of record on a specified date, usually some time after the date of the meeting of the board of directors. The names of the stockholders appearing on the books of the company on that date are legally entitled to the current dividend, even though there is an interval elapsing during which no transfers are made. Stockholders of record at the beginning of this period are entitled to the dividends. The books are said to "close" for

the interval The third date of importance is the date upon which dividends are payable, that is, the date when the corporation sends the dividend checks to the stockholders This ordinarily comes a few weeks after the date for the stockholders of record

Another set of conditions having to do with the redemption of the issue while not affecting the yield is a vital factor in quoted prices Bonds ordinarily have a maturity date, as has already been explained Some, in addition, have a callable, or redemption, feature which gives the debtor the option of calling or redeeming the principal under stated conditions on or after specified dates Serial issues also come in this class, in which case parts of a given issue are made to mature definitely in serial fashion, running usually from a short time after issue until the maturity of the last in the series Preferred stocks sometimes are affected with serial, or redeemable, features The method of finding the yield on issues of different maturities has been explained It was shown how with identical yields the price may vary within wide limits This may be strikingly illustrated by comparing a bond which matures, say, in 6 months with one maturing, say, in 100 years In the former case, assuming that the credit of the debtor is good, the price cannot depart far from par since the issue will be redeemed at that price in 6 months' time In case of a bond or stock with optional date of redemption, conservative accountancy requires that the doubt be resolved in favor of the investor This means that, when the bond is selling at a premium, the optional date of redemption, instead of the maturity date, should be selected in calculating the yield, and when it sells at a discount the maturity date, instead of the optional redemption date, should be selected Where bonds are bought at par and redemption is at par, the interval is of no consequence, since yield and cash return are the same

In case the bond is redeemable at a premium, if the cost of the bond is less than the redemption figure, the maturity date is chosen, since the yield will be least under this assumption If the cost of the bond is higher than the price of redemption, then the redemption date should be assumed, since this will produce the least yield

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PART II

THE ELEMENTS OF INVESTMENT CREDIT

CHAPTER VIII

THE INVESTMENT RISK

Safety and risk are the two words most often heard in connection with investment matters. Although statistical data may seem to argue to the contrary, there is nothing more desired by investors than safety. Some years ago a British investment house sent out a questionnaire to a large number of its clients with a view to determining their attitude on this phase of investment. Somewhat to its astonishment the overwhelming majority indicated that the first quality sought by them was the safety of the principal, and that the rate of return was of secondary importance. This probably reflects the attitude of mind of the typical American investor also.

Most losses in investment are due more to imperfect knowledge than to conscious assumption of risk. It is human, and even wise, to demand the highest return obtainable without sacrificing safety. Yet great numbers of investors, many of them of mature mind, do not realize that ordinarily, when a return of, say, 8 to 10 per cent or more is offered, the principal is undoubtedly imperiled. Furthermore, a difference of only 1 or 2 per cent in the return on two issues of a similar type with similar market circumstances is almost an unfailing sign of a wide breach in their respective qualities. Realization of this comes too often only after it is too late. Careful analysis of the investment risk and a will to act upon the results of study are the essential conditions for success in investment.

Indefiniteness of the Term "Safety."—At the outset one is confronted with the question of the meaning of the word "safety." It is doubtful whether many people have given the matter serious enough attention to acquire a definite idea of its meaning, it is even more doubtful if it means the same thing to any considerable number of people. Neither can one be sure that there is not a similar haziness on the part of investment bankers themselves when pressed for definite meaning of the word. If both banker and customer are at sea, there is no hope of an understanding between them. The lack of scientific approach to the subject is mainly responsible for the haziness in the meaning of this vital word in investment. It follows that there does not exist a solid foundation for mutual confidence between the investment banker and his customer. Misunderstandings and loss of confidence are too often the result of such a situation.

To a great many people, a safe investment is one that is "secured," and an unsafe investment is one that is "unsecured." An investment is

said to be secured when it is accompanied by a mortgage lien, and unsecured when unaccompanied by such a lien. The terms secured and unsecured are useful provided they are not made synonymous with safe and unsafe. It is intended in this chapter to show that the safety of an investment rests upon several independent elements, the mortgage contract being only a part of one.

Still others, viewing the matter from the standpoint of law, regard only loans as safe investments. Thus Lawrence Chamberlain in his work on the *Principles of Bond Investment* states, "The perfect investment is a promise to pay; it is always a loan."¹

The simple promise to pay, unsecured by lien upon property, would seem to satisfy this definition of safe investment. The objections to this position are too obvious to require special mention at this point. The analysis of credit in its entirety will develop the different elements in investment credit.

On the other hand, many people regard an investment as safe when represented by fixed capital and equipment, or land. Physical appearance creates a feeling of safety with many who are unaccustomed to thinking in financial terms. It is hard to convince the farmer, for instance, who has had a life-long experience in close contact with the land and thereby gained a feeling of its usefulness to society, that the value of land is something separate from its physical indispensability. The stocks of new enterprises are frequently sold through organized inspection tours of the plant already completed or under construction. The impressive character of the physical plant often satisfies the novice who does not take the trouble to inquire into the nature of the management, the character of the product, or the other circumstances that spell the difference between success and failure. The mere physical plant alone is inadequate to serve as a basis for a conclusion as to the safety of the project. Money is continually being sunk into enterprises which from the engineering point of view are admirable, but from the economic point of view rest upon a foundation of sand.

Mention should be made, also, of government approval of corporate enterprises under "blue-sky" legislation. The main purpose in the intervention of public authority is to eliminate fraudulent enterprises. But to eliminate fraudulent concerns is not to guarantee the securities of *bona fide* undertakings, which of necessity receive their charters from the same authority. Furthermore, a concern may start out in business with the best of intentions on the part of the promoters and afterwards fall into the hands of unscrupulous persons who commit acts of fraud which did not appear probable at the inception of the business. It is also true that the ordinary risks attached to thoroughly legitimate enterprises are so great in some cases that no one can predict their future. To

¹ See Chap. III of the revised edition where the matter is argued at length.

consider these enterprises safe merely because they have been granted charters by a state officer charged with the elimination of fraud is as unwarranted as it is common. To attempt to grant charters only to corporations engaged in riskless undertakings would immediately stop all progress. At best, blue-sky legislation can only prevent fraud, the state cannot hope to act as sponsor for the legitimate investments of its citizens.

Commodity Prices and the Investment Risk—It is often pointed out that the rise in commodity prices, or, what is the same thing, the decrease in the purchasing power of money, is sometimes so rapid that it not only offsets the yield on the investment but may leave the investor with less purchasing power than he possessed at the beginning. For example, suppose money to be loaned at 4 per cent for 1 year, and during this time, owing to the influx of gold, the index number for commodity prices shows a rise of 4 per cent, or 4 cents on the dollar. In what position does this place the lender? At the end of the year he recovers the principal, say, \$100, plus the interest, \$4, or \$104 in all. But on account of the rise in prices during the interval, his purchasing power is the same at the end of the year as at the beginning. Still more serious is the case of rapid inflation such as appeared during the war period. The money invested in interest-bearing securities in the pre-war period has lost much of its purchasing power on account of the rapid advance in prices. Nevertheless, had the lender chosen to keep his money in the bank, he would surely have suffered a loss in purchasing power. While such changes in purchasing power undoubtedly are continuously working injury on investors, it is notwithstanding impracticable to take account of this factor in connection with the question of credit analysis.

Moreover, monetary risks do not affect all persons alike. When it is said that commodity prices have advanced or declined, reference is made to the general index number, taking into consideration commodities of every kind. The logic of the argument would require an index number for each individual with reference to the particular commodities he buys. Nothing is more common than unequal price movements due to monetary changes continuously in progress. Consequently there is always a maladjustment of prices, some advancing more rapidly than others with consequent injury to the owners or consumers of goods, the prices of which lag behind others or behind the general average. On the other hand, some commodities are constantly changing in price, independent of monetary conditions but due to changes in the relative expenses involved in their production. In the absence of monetary changes, other commodities would rise or fall in proportion to the fall or rise in the cases supposed. This result is explained on the basis of what is usually referred to as the "quantity theory of money," the details of which are too intricate to receive consideration here. But whatever the cause, changes in commodity prices are continuously in progress and any attempt to take

account of these changes in the analysis of investment risk must prove more or less confusing

Time Element and Risk—Perhaps the most perplexing question in this connection is that concerning time in its relation to risk. It has already been shown that loans and securities bear very different dates of maturity. Bank loans usually run only a few months, corporation notes expire in from 1 to 2 years, bonds run from 10 years upward, while stocks are usually indefinite, carrying no specific promise whatever as to their redemption. Where the time is relatively short, say, from a few months to several years, it is possible to interpret safety with reference to the date of maturity or redemption by the borrower. Most investment issues, however, run for periods longer than 10 years, beyond which it is difficult to foresee. Most investors probably are content if they see no clouds on the horizon for a period of 5 years ahead. Yet this does not solve the problem and there is urgent need for more definiteness in the interpretation of risk with reference to the time element. The maturity date for most securities is 20 years and upward from the time of issue. It is necessary, therefore, to establish some definite conception of the time element in its relation to risk which will be applicable to all issues regardless of their maturity or redemption date.

It must first be pointed out, to use the words of Professor Huebner, that the "intrinsic values of stock and bonds . . . must be ascertained by much the same methods of analysis."¹ The legal distinction between stocks and bonds often pointed out by investment writers, while real from one point of view, has too often been permitted to obscure a large portion of the field of corporate investment. After all, bondholders are contingent owners of the corporation. The method of analysis developed in this volume is applicable equally to stocks and bonds.

Emphasis must be laid on permanency, or "the result of the decade,"² regardless of the maturity of the issue, except in cases where it is of short duration. Banks habitually and correctly interpret safety in terms of the maturity date of their loans, but this is because of the shortness of the period involved. One may expect to see at least a few months or even a few years ahead; and if there appear causes for concern within this period of time, the credit of the business or government concerned is accordingly impaired. But for longer periods of time the case is different. In a world of changing values, it is expecting too much for the investment analyst to forecast the future for a period longer, say, than a decade. One might indeed calculate the possibilities and even the probabilities of longer periods which would influence the final credit rating, but only small weight can be attached to probabilities in the distant future.

¹ *The Stock Market*, p. 291.

² Professor Huebner's insistence on this is timely.

It would seem that safety in investment implies a reach of time long enough to include a major business cycle and embrace a severe financial crisis. During the progress of such a cycle, all industries move through the different phases of depression, recovery, prosperity, and liquidation. If a business shows itself to be well sustained through all phases of the cycle, there is reason for confidence in its future. If business moved along an even path one year with another, the results of a single year would go far toward furnishing a basis for credit rating. But as it is, the real test can be made only by taking into consideration a period long enough to embrace the good and bad years alike. Government affairs are also influenced by the different phases of the business cycle, a well-ordered system of government finances will provide for the lean, as well as the fat, years against apprehension on the part of the bondholders.

One may view the matter from a slightly different angle and conclude that the element of time in itself is of no special importance. This view would regard time merely as the fulfilment of all experience. Attention is then directed to the tests rather than to the ability of a concern to make a good showing during a given interval of time. Perhaps the most important corollary of this position is that instead of regarding all business depressions of similar intensity we select the severe depressions for our final and most crucial test. There is much merit in this. For instance, the mild depressions of 1924 and 1927 made only a minor impression upon American corporate earnings. But the depression of 1930-1932 proved to be a test of the severest kind and threatened bankruptcy to corporations previously considered impregnable. Certainly the ability of a concern to pass through a crisis of the recent type would seem to give it a clean bill of health.

Temporary financial difficulties sometimes occur in business as well as in government finances. Occasionally a corporation gets into temporary financial difficulty but involving in no way certain issues of its securities. Occasionally governments default on their obligations on account of short-lived circumstances. These and similar cases raise grave doubts. At such times the securities concerned cannot be disposed of except at a sacrifice. It is certain that the ability to convert the security into cash at will has been impaired either through the fault of the maker or on account of circumstances over which no control could be exercised. It is pretty certain, too, that in such cases the commercial world would regard the credit as being impaired. Yet should the investor take so radical a position? As long as the cause is temporary or external and if time will bring its correction, too severe a condemnation of the maker of the obligation is unwarranted. On the other hand, if something should occur that permanently alters the status of the security and the price suffers accordingly, this would be a cause for deeper disappointment to the investor. It is the permanent status of invested funds that con-

stitutes a more reasonable interpretation of the idea of investment credit. This is the view of the courts in dealing with failed corporations. Their chief concern is always with the ultimate result. It may be highly inconvenient not to be able to turn one's property into cash upon short notice, but it would be expecting too much to demand instant convertibility of one's investments into cash, however desirable such a privilege may be.

Principal and Income.—Principal and income are correlative terms in investment. One speaks of one's principal as the amount of invested capital. This simple statement, however, while conveying the general idea connected with this term is not sufficiently definite for practical purposes. These terms are like many others used in investment in that there is a great deal of haziness surrounding their meaning.

It is not necessary here to discuss the term "invested capital" as used by the accountant, the income-tax man, and others, each approaching the matter from different angles. From the point of view of the investor alone, the term has a variety of meanings. First, may be mentioned the idea that the word "principal" embraces the amount of money obtained by the corporation or borrower from the purchaser of the securities, neglecting as of minor importance the matter of banker's commissions and similar charges. It represents the amount of money involved in the transaction between investor and borrower. This may or may not approximate the face value of the stocks, bonds, or other securities purchased. In the case of bonds and preferred stocks, it is likely to be approximately that amount, allowance being made for a small premium or discount on the bonds at the time of flotation. In the case of common stocks, the invested capital is likely to be very much less than their face value. Common stocks often represent mere gifts or bonuses to the holders of the other securities of the same corporation or to its promoters, in which cases the amount of invested capital, or principal, would be nothing. In any case, the idea of the principal here in mind has to do with the outlay to the investor in the acquisition of the security.

During the course of development of the successful business concern, the stockholders, representing as they do the proprietary interests, find that the accumulating surplus has increased the equity back of their stock. If this may be looked upon as permanent, it represents additional investment in the business brought about by the use of earnings which economically speaking belong to the stockholder and, therefore, may be looked upon as a form of reinvestment of what is rightfully his property. It is permissible in such cases to consider the principal of one's investment the original outlay plus the portion of accumulated surplus assignable to each share of stock. For the preferred stockholders and bondholders, the principal usually does not exceed the face value, for the contract limits the obligation of the corporation or borrower to this amount. The

case of bonds and preferred stocks redeemable at a certain figure above par is a minor exception to the general rule

It is everywhere recognized that the safety of the principal is the chief quality of a high-class investment. One of the leading trust companies puts the matter thus "Safety of principal should always be the foremost and guiding consideration in judging the respective merits of the investment offerings" The other indispensable quality relates to the amount, regularity, and certainty of income. Safety of principal is primarily concerned with risk, while the second is primarily a matter of gain or profit From an economic point of view the principal in some degree at least has been accumulated at a cost; while the gains are the reward in the nature of a surplus and only to a limited degree may be regarded as reward for saving Income, therefore, for the most part, does not represent a cost but a surplus to the investor, a clear gain, a price which the owners of funds are able to command The principal sacrifice was in the saving and accumulation in order that something might be had for the future

Moreover, income accrues continuously and is paid at regular intervals of 3 or 6 months, or a year In the case of interest on mortgages and mortgage bonds, default in a single payment automatically matures the principal Legal action can then be instituted for the recovery of the principal and the accrued interest Likewise, default in interest payments on debenture bonds ruins the credit of the borrower and leads to legal measures designed to protect the investor The amount of the loss to the investor from non-payment of interest seldom amounts to more than a fraction of the principal There are some notorious exceptions to this in the case of the government bonds of Russia and Mexico where the investor is powerless to enforce the contract In the case of corporations, however, steps toward settlement will ordinarily be taken immediately Where dividends on preferred stocks are cumulative, their suspense usually results only in temporary loss In the case of non-cumulative stocks, dividends once passed may never be made up, and the loss to the investor is considerable. On the whole, nevertheless, the protection of the principal is of prime importance, and the income of secondary consideration

There is a sense, however, in which interest or dividend payments are of the utmost importance Many securities, both stocks and bonds, as well as other forms of investment, are inadequately supported by property values, so that when the interest or dividend payments are endangered or omitted entirely, serious loss occurs to the principal Such is the case of most stocks and many debenture bonds Here the income is important because it serves as a necessary support to the values of the securities themselves Many securities, on the other hand, are supported by property values and other considerations and are strong

enough to stand alone. The omission of interest payments in such cases is only temporary and affects the principal only to a moderate extent. Such are most real-estate mortgages and mortgage bonds, the underlying bonds of railroads, or those of well-established public-utility companies.

The Credit Risk.—Within the limits indicated above, investment risk is made up of three distinct parts: the credit risk, the market risk, and unpredictable risks. These risks are different in their nature and arise from entirely different circumstances. Each one in itself is the product of a group of coherent forces and circumstances permeating the fabric of economic life. Each risk is a powerful determinant in the constant changes in the market prices of securities. In fact all of the changes in quoted values manifested in the market are attributable to one or more of these groups of conditions, which act independently of each other, sometimes exerting their influence in the same direction, but frequently in opposite directions when they may to some extent offset each other. A proper understanding of the nature and operation of these forces constitutes the heart of investment knowledge.

The credit risk is perhaps the most important of the three risks. It has to do with the maker of the security, the authority of issue. Modern investment gives rise to a relation between the owner of investment funds and the beneficiary or user of these funds. Funds are transferred from the owner to the beneficiary on the basis of a definite contract. The main provisions of the agreement between the parties to the contract depend on the credit of the beneficiary. Will he be able to "make good" at the time designated in the instrument of contract? On the case of stocks and other irredeemable securities, or long-time issues, what is the probability of the maintenance of the current credit standing of the maker in the future? If the maker is able to fulfil his obligation at maturity, or if he is able to maintain his credit standing indefinitely, the investor can suffer no loss on account of the credit risk. But if credit is impaired through changing circumstances surrounding the corporation, or government, or other maker of the obligation, the security holder stands good to lose, provided the effect is not counteracted by forces having to do with other risks. The credit risk is usually judged by the record of the corporation, or government, or other issuing body under consideration. If the record is good and shows a tendency toward improvement over the past, it may, in the absence of known forces which may impede its further progress, continue to improve its credit in the future. But if the record shows a downward tendency, and if there is no known cause which would produce a change for the better, the outlook for the future is worse. In short, the credit risk is composed of the marrow and sinews of the financial structure of the corporation or other issuing body.

The credit risk may be thought of as being constituted of two separate parts, which have been called the "business risk" and the "financial

risk"¹ The business risk has to do with the business as a unit regardless of the amount or kinds of securities outstanding. It has reference properly to the nature and amount of the assets and income of a corporation, which are the vital factors in determining the probability of the investment remaining intact and which assure adequate return on invested capital. The likelihood of the permanence of the assets and the sufficiency and stability of the income make up the business risk. Stability of income refers to net income and is a function of the relation between operating and overhead costs, excluding interest, and the gross receipts.

Financial Risk—The financial risk refers to the relative position of the individual security with reference to the capitalization of the concern. Concerns with high bonded indebtedness are more likely to become insolvent for sheer lack of cash or earning power during stringent times. The stockholders of such concerns being the residual claimants on both the assets and income are compelled to accept the greater risk inherent in such a situation. Their profits are correspondingly greater in case of success of the business and sufficient cash to tide over depressions. A simple illustration will make the distinction between the business and the financial risk clear. Suppose a real-estate corporation having a capital of \$1,000,000 becomes financially embarrassed. If the capital is represented by stock exclusively, then in the event of liquidation or receivership of the concern, the entire proceeds of the sale of the assets which may possibly amount to 50 or 75 per cent of the purchase price will become available for the stockholders. They might, accordingly, recover 50 or 75 cents on the dollar invested and thus limit the loss to a comparatively small amount. On the other hand, imagine the same corporation to have \$500,000 of bonds and \$500,000 of stocks. The bonds are a prior claim on the assets and in the event of winding up the business there may be nothing whatever left for the stockholders. In the first instance the business risk alone was present, but in the second case both business and financial risks played their part. Again, suppose the net earnings of the same concern to be \$30,000 for the year. This would represent a return of 3 per cent available for the stockholders in case there were no bonds, but if there were \$500,000 of bonds floated at 5 per cent, it would require \$25,000 to meet the interest charges, leaving only \$5,000 for the stockholders, which represents only 1 per cent on the investment. In the first instance, the business risk was the only risk of the stockholders, while in the second, the financial risk was added and resulted in wiping out most of their income. Where the business was conducted without the issue of bonds, the stockholders were entitled to all of the equity in both the property and income; but where 50 per cent of the capital was represented by bonds, the stockholders were doing business on a smaller or thinner equity and were entitled to only the residual share in both prop-

¹ See HASTINGS LYON, *Capitalization*, p. 54.

erty and income. The thinner the equity, the larger the financial risk

The Market Risk—The market risk has nothing to do with the internal soundness or condition of the maker of a security, but has its origin in the general investment market. The condition of the investment market often influences the prices of securities as greatly as credit standing itself. The interplay of the forces of supply and demand in the investment market results in distinct movements in security prices. For the present mere enumeration will suffice. There are the long-time or secular trends of prices, the shorter swings or cyclical movements, secondary or reactionary movements, and daily fluctuations. The effect of market conditions on prices in all of these movements is manifested without reference to the internal conditions of the particular company and is usually measured by taking the averages for the different groups of securities concerned. In all price movements, the investor must distinguish carefully between those resulting from internal changes and those resulting from external changes. Frequent reference is made to the movement of the interest rate in this connection. It has already been shown that interest rates are the result of the balance between the supply of and demand for current investment funds employed in safe undertakings. The market risk affects stocks and bonds alike, however, although showing itself more clearly in the case of safe bonds because their yield represents a "riskless" return. The yield from all kinds of securities, nevertheless, is affected by the amount of investment funds in the market.

The market risk is the chief concern of those who emphasize the importance of the time to buy as well as what to buy. It may be added that the time to sell is also of equal importance with the time to buy. Money is regularly made in Wall Street by those who are intelligent and possess the power of restraint by taking advantage of price movements resulting from changing market conditions. Such investors confine their purchases to well-secured bonds or stocks, preferring to assume only a minimum of the credit risk bound up with individual corporations or governments. Those desiring to assume a certain amount of both the market and credit risks will find their opportunity in the purchase of reasonably well-secured stocks and bonds, neither the safest nor the most speculative, purchased during business depression when prices are low and money plentiful. As the recovery in business sets in and earnings increase, prices begin to move strongly upward.

In this connection, the date of maturity of the issue is an essential condition of success. The prices of long-term or irredeemable issues, as has previously been pointed out, move inversely to money rates and in proportionate degree. The prices of short-term issues or those whose maturity dates are near at hand cannot depart far from the face value, for in this event their yield is affected in disproportionately large degree.

by the approach of the date of redemption. The type of security bearing the greatest market risk and at the same time offering the greatest opportunity for profits is therefore the long-term or irredeemable issues.

Unpredictable Risks.—Credit risk and market risk are both subject to approximate determination by statistical and economic analysis. The third type of risk, however, is composed of more or less diverse elements and is seldom subject even to intelligent guess. No matter how sound the credit structure of a business may be or how certainly the market movements of security prices can be foretold, it still remains true that all investments are subject to risks which cannot possibly be foretold and in the event of materializing may set all calculations at naught. This is only a part of the general uncertainty of economic life or more generally speaking of life itself. Although fully aware of hazardous circumstances surrounding us, one habitually acts as if they did not exist. The American life insurance experience tables show that at the age of twenty-five out of every 1,000 men living 8.06 will die during the year. Nevertheless, it is only in rare instances that persons can be found who arrange all of their affairs to meet the possible eventuality. Just as life may be terminated by a thousand and one different diseases and maladies none of which can be foretold, so investments are subject to many reverses and calamities which are hidden from the vision. They are generally taken as a matter of course and furnish good foundation for the statement that no investment is 100 per cent safe. In some cases it is possible to discount the risk, but the most significant of the circumstances of this group of risks cannot in their very nature be predicted or discounted.

While unpredictable risks sometimes affect only one or a limited number of issues, they are more often general in their influence and alter the status of large classes of securities. Among the first kind may be mentioned certain forces of nature as, for example, floods, the tides, fire, storms, and earthquakes. It is common to insure against fire and tornado, but the losses almost invariably exceed the face of the policy. Telephone companies especially are exposed to the hazards of wind and ice which frequently inflict many thousands of dollars damage and have been known to bankrupt the companies affected. In fact, damage from this source is so common that telephone companies either carry reserves against such losses or regard part of their surplus as a reserve. The Mississippi Valley is subject to floods from the rivers that traverse its course. Farm lands, cities, and towns along these streams may at any time be partially destroyed or wiped out entirely. The tides often furnish cause for equal fear. In this connection may be recalled the Galveston flood and the San Francisco disaster which destroyed untold millions of dollars of property. More recently the flood of the Arkansas River in Colorado all but wiped out certain sections of the city of Pueblo.

Closely connected with some of these disasters is what might be called the engineering risk. In the case of Pueblo, for instance, a large portion of the flood was due to the giving way of a reservoir dam situated many miles distant in the mountains. Even though the best engineering skill is used, mistakes are sometimes made either in the physical construction of the work or in undercalculation of the forces against which resistance is provided. Some of the earlier-constructed engineering works are especially hazardous on account of the experimental stage of engineering technique at the time of construction. New structures are likely to be more reliable. Hydro-electric plants are especially exposed to the engineering or experimental risk on account of the strength and character of unknown forces which are constantly working for the destruction of the dams and other parts of the plant. The experience with the Panama Canal may be profitably called to mind in this connection. Slides occurred which occasioned time and expense to remedy before the canal was again safe for passage. The events cited here and many others which will readily occur to the observer are always possible and come in unexpected times and places with losses to investors. Some of the losses from this source have been eliminated from the safest class of securities through financial expedients, but many of them cannot thus be eliminated and it behooves the investor as far as it is within his power to discount even the possibility of their occurrence.

The foregoing risks by no means exhaust the possibilities of unpredictable risks. There are others even more unpredictable and dire in their calamitous consequences. Of outstanding importance are the catastrophes of war, the inevitable inflation of the currency with its train of maladjustments, the risks of political parties and measures, and the dangers of social revolutions. Wars cause a derangement of the whole economic system. While some industries become enormously profitable through government demands for materials and supplies, others are prostrated through government control of capital and the materials which become unavailable for the fulfilment of contracts already entered into. The commandeering of a nation's resources for the waging of war on a modern scale is without doubt necessary, but, on the other hand, it frequently amounts to confiscation of property. The disturbance of international trade disorganizes the economic machinery of nations mainly dependent upon this form of activity for their normal existence. The export of gold and the inflation of currency have added to the already full cup of disaster.

Few realize the extent of the risks of politics. The demagogue is always present with the latest nostrum for the cure of economic ills. Financial and economic laws are being continuously violated through his misguided zeal. Laws are enacted which sap the vitality from sound banking institutions, impair the credit of railroads and public utilities,

impose an impossible tax burden upon selected corporations and the owners of their securities, while allowing other forms of property to escape their just share of the public burdens. The credit machinery is sometimes manipulated by government fiat so as to endanger the stability of large amounts of capital, the courts render decisions that are inimical to accumulation and investment. No detailed mention need be made of the thousand and one schemes that are constantly being proposed by political aspirants which if put into execution would wreck some of the most essential industries of the country.

This brief rehearsal of the risks of investment is in some degree discouraging because it shows the impossibility of attaining absolute safety under present conditions. Furthermore, there seems to be no ground for imagining that much improvement will be made in the near future. To be sure, there has been improvement in some respects which lessens or segregates much of the risk of investment. Such is the development within the past century of fire, life, tornado, theft, and other innumerable forms of insurance which serve the purpose at least of distributing the losses instead of allowing them to fall upon the individuals immediately affected. Transportation and communication have enormously improved, rendering the operation of business vastly more certain. Financial machinery has likewise developed so that when properly utilized it renders insolvency improbable. Risks have also been segregated through the invention of stocks and bonds and other forms of corporate financing. Thieves and robbers are more generally apprehended and brought to justice than formerly.

While improvement can be seen in these and other respects, it must not be overlooked that new risks have developed which to some extent at least offset the advances made. Among these may be mentioned the likelihood of government interference with industry, the advance of democracy and control of legislation by the propertyless classes, one-sided taxation, geographical division of labor, and highly specialized production which render business conditions more uncertain and catastrophes more widespread, leniency in the punishment of criminals, the growing disposition to regard financial obligations lightly, and so forth. It would be a difficult matter to decide accurately and justly the final influence of these changing forces in economic life. The practical lesson to be learned is that of caution, the avoidance of haste in investment, a proper analysis of the ascertainable risks, and the investment of funds in the wisest manner all things taken into consideration. Above all, the investor must retain an open mind, always standing ready to shift his holdings from one class of securities to another in conformity with ceaseless changes.

The Safe Investment.—One may now venture an answer to the problem and say that in the deepest sense of the term a safe investment

is one whose economic value is preserved. If one is thinking of the social significance of the term, then the social value of the investment must be maintained, if one is thinking of the term in the individual sense, then the individual value must be preserved. In either case the value must include both the principal and income. Such an investment is safe against all contingencies, whether these relate to the credit risk, the market risk, or unpredictable risks. Needless to say, this is a high ideal of safety and, although it is generally unattainable in practice, it is the goal desired by all who strive for safety.

This conception of safety looks beyond money values. On the one hand, it is not satisfied with an equivalence of money and, on the other, it does not always exact that full equivalence. In the case of rising commodity prices, that is, decreasing purchasing power of money, bare compliance with the legal terms of the contract falls short of the maintenance of economic values, in the case of falling prices, that is, increasing value of money, full compliance with the legal conditions not only preserves the original economic value but provides a surplus in addition.

Some are satisfied not to look beyond the money surface of things. For such, the preservation of the money equivalence is sufficient. In the case of a loan held to maturity, full compliance with the legal conditions would meet the situation. In practice this would mean that the borrower must meet the obligation according to the letter of the contract. The usual form of the investment contract today runs in terms of the legal tender of the country whose monetary unit forms the basis of the contract. The fulfilment of the contract is thus in part dependent upon the ability of the government to maintain a given standard of currency. In case of equity securities, safety of the principal becomes a matter of the preservation of the essential value of the security and satisfactory market conditions.

The Elements of Investment Credit.—One of the chief tasks confronting the writer on investment is the analysis of risk. A proper understanding of the influences which play their part in risk constitutes a most essential part of investment knowledge. It is the task of Part II of this volume to analyze the credit risk into its constituent elements, the market risk is treated in Part V, and the unpredictable risks are noted in Parts III and IV, where the various classes of securities are discussed.

The process by which investment bankers determine the credit standing of a corporation or government is screened from the public eye, and the novice in investment matters is mystified when confronted with making a decision as to the relative merits of different issues. In spite of the usual thorough and expensive investigation made upon floating a new issue, from the point of view of the public there remains a certain indefiniteness in the facts presented. Although a large amount of information is collected and every detail bearing on the issue has been carefully

searched, there is a lack of definite grouping of the detailed evidence around certain pivotal factors which lie at the basis of credit itself

What is it that gives the investment banker after a thorough investigation a feeling of confidence in the safety of an issue? The answer to this question is by no means simple but the careful observer will discover beneath the surface of the known facts certain fundamental factors which have consciously or unconsciously been the object of examination. Yet for some unknown or unaccountable reason, the mass of evidence has not taken definite form in the presentation of the matter to the public through descriptive circulars. Moreover, some of the vital facts which would strengthen the case of many securities floated on the market are omitted entirely

The credit risk in investment is made up of four distinct and separate elements which should be made the objective of every investigation. These are income, assets, contract, and management. Three of these are treated in discussions on mercantile credit under the terms capital, capacity and character, the contractual element is assumed, since mercantile credit contracts are simple promises to pay. Upon these four elements rests the credit of every corporation, government, or other maker of securities. Although combined in various proportions in the different issues concerned, there is no issue which to some extent does not depend for its safety upon all four of these elements. The income element relates to earning capacity or ability to get an income, out of which interest and dividend payments are made. The asset element refers to the property lying back of the issue which represents the funds supplied by the investor. The contractual element has to do with the provisions contained in the agreement between the maker of the security and the owner. The management element refers to the human factor in economic and financial affairs. It is concerned with ability of the personnel as well as with its moral and financial integrity. These four elements are inherently a part of every financial situation and analysis must penetrate every one in order to be complete.

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CHAPTER IX

INCOME ELEMENT OF CREDIT

As has been seen, investment risk includes the credit risk and the market risk. Both of these are subject to analysis and prediction to a large extent. The credit risk is the subject of immediate attention, while movements in market prices are reserved for Part V. The present analysis deals with the intrinsic values which have their basis in the special conditions inherent in the different issues, each considered from its own individual position. Statements made in this connection, therefore, will have nothing to do with prices established in the market as the result of influences external to the issues themselves. If this be constantly borne in mind, it will spare much confusion of thought and facilitate an understanding of the credit risk.

Investment credit rests fundamentally upon economic values. The main problem arising in the analysis of any given security issue is as to the specific values lying back of that issue. These values are either the income value or the realizable asset values. These constitute the two fundamental economic bases of all security values.

Income versus Assets—At this point some outstanding facts in the evolution of credit may be briefly recalled. For centuries prior to the industrial revolution the common form of loan was the consumption loan. The main concern of the lender during these times was the return of his principal and this depended normally upon the pledging, explicitly or implicitly, of certain property as security. Doubtless many of these loans were eventually paid out of future income of the borrower but in the main they must have been paid through surrender of asset values. As the age of capital dawned, a fundamentally new factor was introduced in the income-producing capacity of the capital itself. With this it was natural to inquire into the relation between the contemplated income from the employment of capital itself and the amount stipulated as the interest. But then, as now, the income from the use of capital was looked to mainly as the source of payment of interest, while the final payment of the loan depended as before upon asset values. If the earning power of the property remained unimpaired when the loan came due, renewal of the loan was possible on the same fundamental basis of income. But if this were impaired and credit gone, the lender could look only to realizable asset values in the satisfaction of his loan.

In the current literature of investment and finance there is no want of emphasis upon the importance of income or earning capacity of corporations in estimating the quality of their securities. This is evidenced by the large amount of space in the circulars of investment bankers which is devoted to the analysis of earnings. Writers on the general principles of finance have likewise devoted large (perhaps unduly large) amounts of space to the significance of this element in credit. In his *Financial Policy of Corporations*, Dewing says, "Bonds issued on the general credit rest, as all other corporate securities ultimately rest, on the earning capacity of the corporation."¹ So investors and speculators alike inquire most eagerly concerning the earnings of a business whose securities they contemplate purchasing.

This emphasis on income is evidence of a fundamental and widespread conviction that the earnings of business enterprises constitute the fundamental basis of investment values. This position may be readily granted if the income of the enterprise be ample and permanent, so as to meet all interest requirements on its bonds. Then little attention need be paid to property values. While this situation is common enough in experience, such loans are only a fraction of all productive investments on the market. The opposite extreme may be indicated in the case of certain publishing houses which have issued bonds, the proceeds of which were spent in increasing circulation through advertising campaigns. Nothing but intangible values can be claimed in this case—intangible values which are subject to all of the uncertainties and fluctuations in subscriptions to which the magazine business is subject. These frequently vanish overnight and investment values crumble. Income values are undoubtedly indispensable to the soundness of all corporate securities. But the sustaining force of asset values constitutes the ultimate security when business income fails. It is, furthermore, true that both income and assets are conditioned upon the legal and moral sanctions with which every corporate issue is invested. Income may then be regarded as the *sine qua non* of investment values but it, nevertheless, falls far short of providing that degree of certainty which can be attained in practice only through the sustaining force of property values and the legal and moral sanctions accompanying all investments.

Consumption Loans—In the above discussion one has had corporate issues especially in mind. In the case of public and private consumption loans, payment of interest is conditioned upon the availability of income drawn from sources other than the productive capacity of the property which brought the loan into existence. Such loans represent only advance consumption on the part of borrowers and in the normal course of events they are ultimately to be satisfied, like all expenditures for consumption purposes, out of earnings from various other sources of

¹ Page 141

income. Loans of this type were historically the earliest to make their appearance and are today still very common. Such are the loans of building and loan associations and other agencies which provide capital for residence property, instalment loans of all kinds, and the like. In all of these instances the extraneous sources of income are varied according to circumstances of the individual borrowers. The problem of credit then is to discover the amount and nature of personal incomes. These are likely to be a composite of personal earnings, salaries, and profits of undertakings, as well as interest and dividends on investments. But the applicability of personal incomes to the satisfaction of investment obligations is conditioned again upon the personal circumstances of the borrowers which are generally unknown and likely to be of transient nature. The net result is that in practice limited attention is paid to personal income in consumption loans. The main security of all such loans is sought in the actual property concerned rather than in the income of the borrower. The fact that such loans as a class have a very satisfactory record is due, however, both to personal income and to the property values back of the loans. Payment of these loans is commonly made from personal incomes but private consumption loans could not be made without the indispensable factor of the chattel mortgage or lien on the property in question.

Government Loans.—Government and municipal securities call for brief treatment here. Most writers stress good faith in this connection and often to the negligence of other elements. If the government or municipality has sufficient revenues so that the interest on the obligation can be unquestionably maintained, its credit will remain unassailed. On the other hand, no matter how flawless may be the faith of the obligor in keeping its promises, no matter how long a record it may have for the unquestionable satisfaction of its obligations, if the time ever comes when taxation weighs so heavily upon the people that it becomes an unbearable burden, the interest payments would assume an uncertainty which would immediately be reflected in the price of the loans on the market. The obligation in such a case becomes questionable, not because of lack of good faith but out of sheer inability to pay. But it is not a matter only, or even chiefly, of interest payments. The principal of public obligations itself can be paid only out of taxation and other revenues. If it is assumed that governments and other civil bodies should pay their debts, the ability to pay is represented by the taxability of the people, which is the only practical means of discharging public obligations. The income of governments is drawn from the income of the people, and no government could endure that filched the lion's share of this from the people. The precise percentage which can be gathered in taxation depends wholly upon the circumstances in each case.

The importance of the income element of credit in government and municipal bonds may be illustrated from past history and from recent events. In the days of internal improvements in the United States both states and municipalities which had lent money for these purposes defaulted mainly for the reason that they were unable to pay interest, although there are examples of broken faith. Wholesale defaults on South American bonds in 1931 were due largely to inability to meet interest requirements. This inability resulted partly from the decline in the prices of export commodities and partly from an unfavorable exchange rate brought about by the world financial crisis. There was probably no case of willful default.

Income as a Basis of Credit—In the case of long-time corporation bonds and stocks the income element of credit plays a far more important role than it does in the case of short-time loans. Typical commercial loans to business concerns, when properly made, rest not so much on earnings as on the value to be realized out of the sale of assets in the regular conduct of the business. The amounts of such loans usually preclude the possibility of payment from net earnings. But in the case of long-time investment issues, the income of the corporation is depended upon to pay not only for accruing interest but frequently also for the redemption of the debt through sinking funds or other accumulations. If the credit of the concern is satisfactory when the loan matures, refunding is always possible so that the principal of the loan in reality may never be permanently canceled. Both the interest and principal thus depend upon the earnings of the corporation for the maintenance of their integrity.

In the case of fixed- or maximum-income securities the reliance of the investor is largely upon the earning capacity of the corporation. This must be in excess of the amount required to satisfy the payments as they fall due. In other words, there must be a margin of safety in annual earnings over interest or dividend requirements to insure safety. If this margin is sufficient to satisfy the demands of investors for riskless investments, the income alone will be sufficient to maintain the full credit of the bond or stock.

This general reasoning applies also to common stocks and participating issues. It has become the general custom in the case of the stocks of stable value to establish dividend rates at the point where they possess reasonable stability. In stocks of this class the customary rate of dividend is regarded in the same way as in the case of fixed-income securities. It then becomes only a matter of calculating the margin of safety in earnings over dividend requirements.

When the income is not sufficient to guarantee the payment of interest or dividends, the issue is reduced to the class of risk-bearing investments. This immediately affects the value of the issue, since a pre-

mium for the risk is demanded by investors. In the field of finance, certain income standards have been set up and have become generally recognized as necessary for riskless investments. Anything below these standards tends to raise doubts and the risk increases in proportion as the income falls short of accepted standards. Analysis of securities from the standpoint of income becomes largely a matter of setting standards of safety in margins. Risk then becomes a function of the failure to measure up to the accepted standards.

Income Requirements.—Standards of safety themselves depend upon certain characteristics of income. Aside from the matter of adequacy which may be designated as the first requirement, the characteristics of permanency, stability, and quality all affect the standards set and the risk involved in the various issues.

Stability.—In addition to being adequate, the ideal income for investment purposes is the one which is constant in amount from year to year. This inspires certainty and would insure adequacy at all times. But few business concerns produce income which is free from significant fluctuations. The greater these fluctuations, the greater the uncertainty. In practically all forms of investment, payments have to be made either annually, semi-annually, quarterly, or even monthly. The assurance of ability to meet these payments then must be as continuous as the payments themselves. Furthermore, the greater the instability of corporate earnings, the greater must be the total of income over a series of years in order to produce the same assurance to investors that funds will be at hand at all times. Adequacy in case of unstable earnings is best measured by the years of minimum income. Corporations of fluctuating earnings, therefore, will find a larger total margin over requirements necessary than corporations of constant earnings.

Permanence.—The question of permanence is also of vital importance. Industries in which the services of capital have shown a permanent value produce more confidence in investors than those of transitory value. Industries that meet the fundamental wants of the people become fixed institutions in economic life, while those that cater to a passing fancy have an unsound basis of investment values. Ideally, the question of permanence should coincide with the life of the security in question. But we have said in another place that the distant maturities in the investment field are little better than mockery and that, after all, the only pragmatic meaning that can attach to the term permanence is that of perfectness. As far as it lies within the power of human vision to discover flaws in the fundamental relation of earnings to requirements, just so far does it lie within the human vision to scrutinize the future. Permanence can mean nothing else than than perfectness, and perfectness in turn is conditioned upon the assignment of unpredicable events to the realm of oblivion. Nothing further,

then, can be required in connection with the question of permanence than that the investment be able to stand the most scrutinizing tests and analysis.

Quality—The quality most desired in corporate income is that possessed by money, since obligations and dividends are always payable in money. The mere statement of this seems to be a truism, nevertheless earnings are commonly affected by other qualities than money. In several respects one has to delve beneath the surface to discover whether so-called "earnings" are really the stuff out of which the corporation can satisfy the financial demands made upon it. Reported earnings are too frequently affected by adjustments of inventory and supplies to the lower of cost or market, which may result in an understatement of actual results for the period immediately preceding. In turn with reversal of conditions, earnings are frequently overstated through the sale of products at advanced prices. In either of these cases the implied meaning of earnings is violated. Earnings should represent, first of all, the result of operating the business.

In the second place, earnings may result from operations but the proceeds may be reinvested in inventory and supplies or fixed assets and hence be unavailable to meet the company's obligations. Again, earnings may result from a liberal credit policy, in which case funds may be tied up in receivables and again unavailable for other purposes. Dividends frequently depend upon available cash as well as upon earnings and it is of the highest importance that a suitable cash policy be followed so as to attain this end.

Income Analysis.—Income has been defined in accountancy as the net addition to the business over a given interval of time, and deficits as the net deductions. This is undoubtedly a broad conception of income and the final results of the conduct of business must be measured by such standards. Viewed in this way the analysis of corporate income involves discussion of all the features of current operation and, in addition, certain other matters affecting current changes in the financial affairs not directly associated with the primary activity of the business. Again, detailed income statements of accountants include all items of outgo as well as income. Indeed, sound analysis of business activity is possible only when all outlays and charges, as well as receipts, are included.

For the detailed items of business income the investment analyst is dependent upon the published results of accountancy. Unfortunately, these detailed items are not always published, so that the investor is helpless in many situations. Moreover, as regards published items we earnestly wish for uniformity of detail in accounting although this is not to be found in practice. Within recent years there has been much improvement in this respect but it can hardly be said that, except for railroads and public utilities, scientific or uniform accounting has been

achieved. Through the influence of public regulation, railroads and public utilities have made substantial progress. The former in particular, under the guidance of the Interstate Commerce Commission, now publishes reports that leave little to be desired. But in the general field of industry, until recently, there has been a notable absence of any progress. But through the influence of the administration of the federal income tax, considerable advance has been made. Yet the analyst is too commonly confronted with a degree of diversity, obscurity, and uncertainty that might well cause him to despair of dependable results.

No matter how perfect the income statement may be, there are certain facts about business operation that cannot be revealed in financial statements. These have to do with technical matters which lie outside of the field of accountancy. They are mostly physical and commercial facts and raise engineering and economic problems. Money statements cannot reveal the efficiency of labor and machinery nor can they give a qualitative analysis of the trend of the business. It is only through the discovery of the causes for trends in expenses, outlays, and charges that a close view of financial soundness can be attained. In recognition of these and other matters, modern requirements demand supplementary reports accompanying the annual financial statements setting forth these matters. Here, too, progress is being made, but for many corporations this represents an uncultivated field in publicity. The investor frequently has to depend upon other sources for information concerning these matters.

Income Statement.—Before a definite procedure in analysis can be undertaken, it is necessary to rearrange the detailed items furnished by the accountant in the interest of accuracy, uniformity, and for purposes of comparison. This demands a logical classification of the flow of funds to and from the business. Such an outline statement is offered below.

OUTLINE OF INCOME STATEMENT

Gross operating income

From which deduct,

Expenses for labor, materials, fuel, salaries, and so forth

Gross profits

From which deduct,

Repairs, maintenance, insurance, depreciation, and other reserves

Net profit

Add,

Other income from investments, sale of asset values, and so forth

Total income

From which deduct,

Taxes, rentals, interest on short-time loans

Net income

Gross Operating Income.—Gross operating income should include only *bona fide* items that arise out of the regular operation of the business. As such, it should include all net receipts through sale of goods or services after allowance has been made for discounts and returned goods. It may also properly include partly or wholly manufactured goods if made on contract, even though undelivered. Some companies even include the cost of goods manufactured during the year, although still unsold, and occasionally a profit is arbitrarily added. Such practices are subject to grave question. Gross operating income should exclude such items as the occasional sale of assets outside the regular operation of the business. It should also exclude all items coming under the head of other income.

Price Changes.—Gross operating income depends upon two factors, namely, the price of the product or service which the organization sells, and the physical volume of sales. Traditionally price controls both the trend of the gross income of the business as a whole and also the stability of business through temporary fluctuations in general business conditions. Price changes are of two kinds, namely, changes in the general price level, and changes in the prices of particular products and services. Both of these present serious problems with which business has to deal.

From the point of view of current operation, changes in price levels are of only temporary importance and affect the income only during the interval of the change and during the period of readjustment which follows. But they are far more serious when viewed from the standpoint of relation of earnings to capital invested. In rising prices, earnings increase without proportional increase in the capital invested and hence this ratio increases. But when prices fall, earnings in relation to capital invested fall also. This is unavoidable because competition of new capital and equipment produced at a lower cost level reduces permanent earnings in relation to original invested capital. At the present juncture this looms as a serious problem in all competitive business. It is likely to present obstacles to the regulated industries also under the principle of reproduction cost in valuation for rate-making purposes (to be dealt with later).

On the other hand, price changes in individual commodities and services are usually the result of changes in the cost of production and do not affect the value of fixed capital and equipment. Nevertheless, these changes create grave problems in themselves, since they render more difficult the ability to maintain net earnings at the accustomed ratio. A number of industries have suffered from this situation since the World War. The difficulties of the sugar, the copper, rubber, agricultural, and other industries are largely attributable to this cause. These industries were expanded during the war and produced in too

large volume to maintain their former position in the price structure. Here as elsewhere the success of individual companies is limited by general conditions in the industry.

Volume—By volume is meant the physical amount of business transacted. It has to do with the number of units of product passing through the organization. Where a business enterprise is engaged in the production of a comparatively few number of products, it is relatively easy to measure the volume of business, but where the variety of products is multiplied, no satisfactory method of calculating volume in its entirety has been invented. In such cases one must be satisfied with data showing trends and tendencies with reference to each of the detailed products concerned. It is of the utmost importance to look beyond the money volume of business to discover real trends. In the case of rising prices the money volume of business is always exaggerated and things take on an unduly rosy appearance. In case of falling prices, such as the world experienced in 1930-1932, the money volume of business exaggerates the decrease in volume. In the reports of corporations for these years, supplementary information is generally given to correct an otherwise too pessimistic outlook upon the future.

The volume of business which an enterprise is likely to secure is ultimately dependent upon the state of the development of the industry in which it is engaged. The progress of a given company in the industry is dependent largely upon the management. It should be remembered that business concerns operating in a new industry are limited in their success by the public reception given to the products. For example, for many years the automobile industry lagged for no other reason than that the automobile was not yet regarded as a universal necessity. The same can be said for the radio, artificial refrigeration, and other industries. In fact, all important industries have had to pass through a pioneer stage which is characterized by low volume of sales and severe competition for the business available. However this may be, increased volume of business has become the watchword of modern factory production. Mass production with all of its weighty advantages has largely shifted the emphasis from price to volume.

Direct Expenses.—The gross operating income constitutes the fund out of which are met all of the costs of carrying on the business. These costs are either direct or indirect. Direct costs include manufacturing costs, selling expenses, general and administrative expenses, the cost of raw materials going into the product, and so forth. Direct costs will include only such items as are occasioned by the actual operation of the business in the production of commodities or services. It excludes items incurred in a program of construction or expansion which are properly charged to the capital account. Nevertheless, the difficulty of making a rigid separation of these costs from operating costs has lessened the accu-

rary of accounting in many concerns which regularly charge such items to current operations. This swells the unit costs over the period concerned and, of course, gives a false idea of current costs of production. Cost items, in industrial concerns where little or no accounting control is exercised by any outside authority, should be closely scrutinized for hidden values.

The control of costs in industry is partly a matter of circumstances and partly of management. Among the more common instances where the management can exercise no immediate control may be mentioned the following: location of the enterprise with reference to raw materials, market, and labor supply, the prices of raw materials, fuel, supplies, and wage rates, access to the capital market; the volume of business at hand, and so forth.

But the things that make for success in the long run are ultimately under the control of the management. Some of the more important factors in reducing costs to a minimum may be briefly mentioned here. First, there is the technical process of production or conduct of a business which must be carried on with the least amount of effort and expense. All waste must be ruthlessly eliminated. There must be the right combination of capital and labor, the right kind of machinery for the purpose in hand, so as to produce the product at the lowest combined cost possible. The retention of old or obsolescent machinery and equipment will defeat the entire program as against more progressive establishments. Second, there must be the proper coordination of all of the units of the enterprise, so as to reduce to the lowest point combined costs. Proximity of the different units of a factory results in great saving in the handling of materials in process of manufacture. Third, there is the matter of diversifying the products, so as constantly to employ to the greatest advantage all capital and labor and reduce to the minimum seasonal and cyclical fluctuations in demand. Fourth, advantageous purchase of raw materials and supplies may materially increase profits. Fifth, proper relations must be cultivated with the labor and administrative officers. In this day of cooperation in industry some plan of admitting these to a share in the responsibility and results of the business seems to be a requisite to success. For this purpose, employee ownership and representation in the councils of the concerns have been devised. They are calculated to secure harmonious relations among all concerned, to create a contented personnel, and to reduce the labor and administrative turnover.

Gross Profits.—If from gross operating income direct expenses be deducted, one obtains gross profits. This item in the outline of income represents the portion of the revenues available for meeting capital costs of all description. The latter include specifically expenses for repairs, maintenance, insurance, depreciation, and possibly other similar items.

Repairs, maintenance, and insurance of building and equipment are properly capital expenses and, moreover, are only to a minor degree under the control of the management. For these reasons it has been deemed best to keep them rigidly separated from all direct expenses.

The question of depreciation deserves special consideration. Depreciation may be for wear and tear, obsolescence, or inadequacy. The technical calculation of depreciation for all of these purposes must be left to the engineer and accountant. At best it is a difficult and uncertain procedure. While in certain types of business such as railroads and public utilities standards have been worked out for averages, they frequently have little application in individual cases. On the other hand, where the policy of depreciation is under the control of no outside agency, too frequently arbitrary standards are set up. Depreciation for wear and tear is a fairly simple engineering problem. But depreciation for obsolescence is a matter of much guesswork. Even the very meaning of the term is shrouded in mystery. Perhaps the principle which comes closest toward defining the idea is that obsolescence results from failure of machinery and equipment to produce results that will meet the competition of more recent inventions and processes. These cannot be calculated with certainty. In practice a large portion of depreciation on this account is not and cannot be provided for in reserve accounts. It is doubtful, except in those rare cases where some degree of certainty can be obtained, whether depreciation for this cause is a proper charge against revenues. Reserves which are subject to no definite calculation might be entirely eliminated from income statements and balance sheets. When they do come, as come they will, it seems to be entirely proper to charge them against surplus. Little advantage comes from segregating varying amounts for indefinite purposes while much is lost to the legitimate income of the corporation. In a general way the above remarks also apply to reserves for inadequacy. The guiding principle in all cases should be the degree of certainty with which calculations may be made.

Whatever reserves may be kept under the head of depreciation, in the nature of the case considerable inaccuracy must always be experienced. It is as easy to err on the side of conservatism as on the side of inadequacy. In the former case earnings are concealed, while in the latter they are padded. The status of the depreciation accountancy is perhaps the darkest spot in the realm of finance. While the policy is frequently made known, it is almost impossible ever to check the actual results of the policy adopted. Here as in so many other places in finance and accounting one has to fall back upon the comparative results in similar fields of enterprise.

Net Profits.—By net profits is meant the difference between the gross income and the sum of the direct and indirect costs of production.

They represent the financial results of the operation of the business. They constitute the residual share of the earnings of the organization attributable to the function of capital employed directly in the furthering of the objects for which the business was organized. Net profits are the best test of the success or failure of the enterprise.

Other Income—Almost every business organization of any consequence will find it necessary to carry an item in its income statement to include all income not accounted for in the regular way. Such income originates from some source not directly connected with the regular operation of the business. Since these sources of revenue are entirely detached from the main sources and occur only incidentally, they are not included in the item of gross revenue, since this would distort certain relationships and ratios which are held to be valuable indexes of the status of the business.

Among the sources of other income may be mentioned, first, income from investment of idle funds in stocks and bonds of other companies or in the obligations of civil bodies. Income from these sources should be restricted to the actual interest or dividends received and realized profits. It would be unwise to include in this item realized profits as represented by change in market prices.

A common source of profit during the boom days of 1928-1929 was the placing of large amounts of corporate funds on the New York call loan market, the so-called "bootleg loans." Call interest rates were high and corporations supplemented their earnings with funds obtained from the sale of their own long-time securities at low interest rates and thereby realized an important additional profit.

Many other sources of other income are found. For instance, railroads frequently engage in conducting hotels and amusements as an incidental adjunct to the conduct of transportation service. Likewise, property which is often held incidentally produces an income in the interval. So also profits on the sale of permanent assets frequently swell the income account of certain years. Tax refunds are often included in other income also.

Whatever the source may be, other income should be carefully separated from the operating revenues so that the results of the management in the conduct of the primary business will stand out. The primary test of business efficiency is in the relation of income which invested capital can be made to produce. Hence earnings on the primary property of a concern should be kept undefiled.

Total Income.—Other income added to net profits gives the total income of the corporation after paying all expenses of conducting the business and providing for upkeep and depreciation of capital. But before this amount is available for capital charges, certain other claims have to be met.

Deductions.—Chief among these are taxes of all sorts levied by federal, state, and local governments. Advanced methods of accounting now require that taxes attributable only to the period of operation included in the statement are to be deducted under this item. This is of especial significance in case the fiscal year of the company does not coincide with the calendar or tax year.

Certain other deductions should also be made from total income before net income is reached. Frequently in the operation of a business concern it is advantageous to rent property rather than purchase it. This practice is quite common in railroad consolidations. Since the operation of the business itself is conditioned upon the continued use of this property, it is proper first to make these deductions from total income the same as in the case of taxes. Both legally and economically, these represent prior claims to the income of the corporation over those of all classes of securities. It is well also to deduct interest charges on short-time loans before arriving at final income available for capital charges. The reason for this lies in the practical priority of claim on income of this type of loan over long-time loans. Moreover, many of these loans are of temporary or seasonal character and are liquidated regularly in the ordinary course of business.

Net Income.—The net income of the corporation is the final figure sought in the search for that portion of income which represents the amount available for interest and dividends on outstanding securities. All other deductions are either a legal or an economic necessity, or more often a combination of both. Net income is the result of what has been called the productivity of capital. This figure represents the contribution of capital to the results of the enterprise. As such, it is the share that goes to capital as its reward as one of the factors of production. The further division of this sum is conditioned upon the relative priority of interest charges, sinking funds, dividends, and the like.

Sinking Funds.—The question of sinking funds on capital obligations is a troublesome one. Sinking funds on bonds or preferred stocks are in no sense a charge upon the operation of the business, since they represent a method of repayment of capital. Logically, therefore, the true revenues of the corporation back of the securities in question are the earnings before the deduction of all sinking funds. It is, nevertheless, true that sinking funds on obligations which have priority over junior issues are a legal obligation of the corporation over the latter. On the other hand, it can be successfully argued that the payment of sinking funds increases the capital values back of junior obligations by an equivalent amount, since it cancels an equal amount of prior debts. It would, nevertheless, place a false interpretation upon income to deduct sinking funds before making calculations concerning the sufficiency of the net income to meet capital charges and dividends. For this reason they

have been omitted from the income statement. Sinking funds often influence the dividend policy of corporations, even though the equities which they represent accrue to the benefit of the stockholders

Holding Companies—Throughout this discussion the operating company has been in mind. It is necessary at this point to give a brief discussion also of the holding company

Two methods of keeping accounts are ordinarily used with respect to the holding company. In the first case, the method of consolidating the accounts of all the operating subsidiaries into one consolidated statement is used. In the other case, each separate subsidiary, as well as the holding company, stands upon its own basis. Good reasons exist for both methods of treatment but not for a given company. Which-ever method is used depends upon the circumstances in each case. The author can do little more here than indicate the principle that should control.

When correctly used, the consolidated statement is designed to meet the situation where all of the subsidiaries are controlled by the holding company and operated as a single business and financial unit. Even though the consolidation of interests may be so thorough that all of the securities of the subsidiaries have been taken up or exchanged for those of the holding company, it may, nevertheless, be desirable for legal, administrative, or marketing purposes to retain the identity of the separate corporate organizations. However, if some of the securities of any of the subsidiaries remain outstanding in the hands of the public, interest or dividend payments on these minority interests must first be deducted before arriving at the net income of the consolidated organization. Consolidations of this type are found most frequently in the field of industrial and manufacturing corporations, which almost invariably issue simplified consolidated statements for the benefit of the general public.

Consolidations of the second type are found largely in the public-utility field where a holding company acquires properties widely scattered. Except for certain financial and broad administrative functions, the holding company is not material to the existence of the subsidiaries. The essential fact here is that each operating utility is of necessity an independent operating unit. It is, moreover, subject to regulation by state or local authorities where it is treated in rate making and in other public relations as an independent unit. All of its affairs are conducted with the sole objective of its own welfare in view. It is almost universally true in these cases that the holding company holds only a small minority of the total securities of the subsidiaries, included in which is the majority of the voting stock. Under these circumstances, it is appropriate for each subsidiary, as well as the holding company, to render separate statements. Holding company revenues then, in

so far as they are derived from subsidiary properties, are constituted only of the actual income received through the payment of interest and dividends on the bonds and stocks of the subsidiaries

Income Ratios.—The efficiency of a management, as well as the financial tendency of a business, is revealed by an examination of certain items of the income statement with respect to the relation they bear to each other. Absolute figures for a single year seldom tell anything worth while. But certain significant ratios running over a period of years show the true character and status of the business. Every kind of business will be found to have financial ratios peculiar to itself. Comparative figures covering different kinds of business are generally meaningless. The matter of financial standards for each type of business is now receiving much attention, but it must be admitted the success that has accompanied most of the studies is meager, and conclusions are at best imperfect. On the other hand, it is only by the establishment of standard ratios for each type of business, or perhaps for each organization itself, and by comparing actual results over a period of years that the true tendency of a business organization can be discovered.

Operating Ratio.—One of the most important income ratios is the operating ratio long used in railroad analysis but also significant for public-utility and industrial corporations. This ratio is the percentage of direct expenses to gross operating income. The reciprocal of this ratio is the profits ratio representing the percentage of gross profits to gross operating income. The operating ratio is best calculated before deduction for repairs, maintenance, insurance, and depreciation, since this class of items is subject to optional charges. Nevertheless, these items are frequently included in expense before figuring the ratio. This is especially the case in railroad finance. But even here the operating ratio would have more meaning if these items were omitted from the calculation.

The true operating ratio gives the percentage of gross returns that is absorbed in direct operating expenses. In industrial corporations an average ratio would be probably around 85 per cent; in railroads, as that term has been interpreted, it is normally somewhere between 70 and 80 per cent, while in public utilities it is somewhat less. Every type of business will have a normal ratio peculiar to itself. The controlling principle is the relative amount of capital employed in the business. Where capital is large in comparison with the value of the output, the operating ratio will be relatively low, where it is small with reference to the output, the ratio will be high. Hence a relatively high ratio in manufacturing concerns, and a relatively low ratio in electric companies. In hydro-electric plants the operating ratio is frequently as low as 15 per cent.

Every manager consciously or unconsciously conducts his business with a certain ratio which he considers normal for his establishment. An advancing operating ratio over a series of years is a danger signal. It will naturally lead to skimping of repairs and maintenance in order to show as large net profits as possible. The hope of the management is that succeeding years will bring improvement in the ratio, when the expenses for repairs and maintenance which have been postponed will be made up and the property brought back to normal condition. A declining operating ratio is just as surely a sign of efficient management. The speculator in common stocks keeps a close eye upon the operating ratio, for when this is high, prospects for profits applicable to the common stock are discouraging, and when it is low, prospects are brighter.

The operating ratio, like all other ratios, must be interpreted with reference to currency conditions. The discussion above assumes a stable currency. In periods of rapidly rising prices, when the prices of finished commodities are rising faster than expenses, the natural tendency in industrial establishments is for the operating ratio to decrease. Periods of falling prices show a reverse movement, the ratio in many instances going beyond 100 per cent. This was the case in the severe collapse in 1920 and is a universal phenomenon in crisis years. The case of railroads and public utilities is different, and the opposite tendency is likely to appear. This is because rates are controlled and advanced sluggishly in periods of rising prices and are reduced in a belated fashion in periods of falling prices. On the other hand, operating expenses increase rapidly while prices rise and descend more rapidly when prices are falling.

The operating ratio has little significance for holding companies. Public utilities are now becoming almost everywhere controlled by holding companies. The gross income of the pure holding company is made up of interest and dividend payments on the securities of the subsidiaries. Neither the gross nor the net income of a holding company has any great significance for the investor. The individual and consolidated income statements of the subsidiary companies, compared with the securities outstanding in the hands of the public, show the real status of holding company securities.

Net Income to Investment.—The true investment ratio is the ratio of net income to invested capital. This ratio shows the final results of the use of capital in the enterprise. It takes into account the effect of the quality of the management, the conditions peculiar to the enterprise itself, and the general situation in the industry at large. Here as elsewhere the trend revealed by this ratio is of especial importance. It represents what the management is able to accomplish with the additional capital entrusted to it by its security holders or that plowed back into the property from surplus earnings. As long as the company is progressive, it will find new uses for additional capital at a favorable trend in this ratio;

but when new uses for these funds have not been found, the ratio is likely to show a declining trend.

This ratio may be divided into two supporting subratios, namely, the ratio of net income to fixed capital and net income to current assets. Overexpansion is revealed when the former ratio tends to decline, and a lack of operating efficiency when the latter shows a downward trend.

The Margin of Safety.—The term margin of safety is frequently used in connection with income. It refers to the proportion of the "balance for charges" which remains after the payment of fixed charges. The balance for charges is the net income remaining after deducting all expenses for operation, maintenance, repairs, and so forth, as well as taxes, reserves for depreciation, and the like. Fixed charges include interest on funded and floating debt, rentals, sinking funds, interest and principal on car trust certificates (in the case of railways), the amount necessary to meet interest and principal payments on serial bond issues, and so forth. If the balance for charges amounts to \$100,000 and fixed charges total \$40,000, the margin of safety would be \$60,000, or 60 per cent. The absolute figure, of course, means nothing, the percentage of the income available after deducting fixed charges indicates the financial status of the business.

When the margin of safety is calculated for each year for a series of years, it gives an accurate index to the financial trend of a business. If it shows a tendency to increase, the business is in a healthy state, but if it shows a tendency to decrease, danger is indicated. If the margin of safety for each year is 30 to 35 per cent or higher, the bonds of the corporation are in a relatively strong position. If the percentage should fall to zero and remain there for any length of time, the credit of the company would be ruined and failure may result. Even before failure occurs, when the margin of safety sinks to low levels, the stockholders' position becomes precarious. Debenture bondholders may also materially suffer even though actual failure does not result.

The Factor of Safety.—All things considered, the figure of most significance to security holders is the factor of safety. This is calculated for each issue separately. The amount available for capital charges constitutes the starting point. It is similar to the balance for charges except that rentals and interest on floating debt have been deducted. These items are so closely connected with the operation of the business that it is necessary to make allowance for them before calculating the factor of safety on capital obligations. The factor of safety is the percentage of the amount of net income remaining after interest or dividends have been met.

Two methods are available for calculating the factor of safety. Whichever one is used, the bonds and stocks of a given corporation must be arranged in order of their priority of claim as shown by the contract, or

as allowed by receivers' courts With this in mind, receivers' certificates would hold first place, then would follow, in order, equipment obligations, first-mortgage and underlying bonds on important property, mortgage bonds of inferior lien in their order, debenture bonds, preferred stocks, and, lastly, common stocks Where there are several series of issues with different claims within a given class, they must, of course, be arranged with the class according to the order of their priority Where there are bonds of equal priority on different portions of a corporation's property representing equal claims on the net income, they should be considered together in calculating the factor of safety. Sinking-fund charges, payment of serial bonds falling due, maturing equipment obligations, and so forth, would always be included as part of the capital charges of the issue to which they pertain

Until recently, the most widely used method of calculating the factor of safety considered bond and stock issues, in the order of their priority, on the basis of the income available for the issue in mind after deduction had been made for charges on all prior issues This gave a new basis of calculation for each issue and yielded a factor of safety for each one independently Under this method of moving-basis, where a relatively small issue followed a larger one, the factor of safety was larger for the junior issue than for the one with senior claim. This result seems unnatural and does not show accurately the real situation A better method of calculation would be to take the amount of income available for capital charges as a basis for issue, or for each set of issues having equal claims The factor of safety would then be represented by the amount of the income available after deducting the charges for each issue, or set of issues, with equal claim, together with all prior claims This would yield a progressively decreasing factor of safety down to the weakest issues This is as it should be, for the weaker the claim, the more hazardous the available income Comparatively small fluctuations in gross may entirely wipe out the margin. This method, called the "cumulative method" of calculation, was adopted by Mr. Moody in 1923 in his rating system and replaces the first method

To illustrate the results of the two methods of calculating the factor of safety, assume a corporation which has issued securities of four different degrees of priority, represented by mortgage bonds, debenture bonds, preferred stock, and common stock Let the interest on the mortgage bonds be \$20 out of every \$100 of net income, and an additional \$10 for interest on debenture bonds The first method of calculation would yield a factor of safety of 80 per cent for the mortgage bonds Debenture bonds would then have available for their interest \$80 of the original \$100 Interest requirements are \$10, which is one-eighth, or $12\frac{1}{2}$ per cent, of the \$80, the amount available This would give a factor of safety of $87\frac{1}{2}$ for the debenture bonds The cumulative method would give a

factor of 80 for the mortgage bonds and 70 for the debentures. Stocks are logically considered in precisely the same way as bonds.

The factor of safety has been criticized on the ground that it assumes a uniform operating ratio which is contrary to fact. It is pointed out that a high operating ratio would render the net earnings subject to relatively great fluctuations and that a high factor of safety with a high operating ratio might not be so safe as a low factor of safety with a low operating ratio.¹ This is a just criticism and points to the necessity of considering other factors in determining the final rating with respect to the income element of credit. It has been suggested that the true factor of safety would take account of interest and dividend requirements with reference to gross income instead of net income. This, however, would possess little, if any, advantage over the other method, since the variation in the figure would be comparatively small and consequently fail to discriminate sufficiently between the different grades of issues.

The question of how large a factor of safety a security should bear depends upon the degree of safety sought. Securities can be found whose factor of safety is so large for their respective classes that there remains no doubt whatever but that interest or dividend payments can be met when due. Some securities have a factor of safety less than zero and consequently are extremely speculative. A wide choice is thus open to the investor, who must choose to suit his own requirements. The real problem is to associate precise figures with different degrees of safety. The key to the solution of this problem must first be sought in an examination of the character of the income. The first general principle which should govern in deciding on the degree of risk indicated by any given factor of safety is that the steadier the income of the business from year to year, the greater the degree of safety indicated by a given factor. Industries showing wide fluctuations in net income require a much higher factor of safety than those showing a steady income from year to year. Where earnings are relatively constant, funds are continuously coming in which insure the payment of interest or dividends when due. When earnings fluctuate greatly, some years may show deficits for the issue in mind, which may raise grave doubts as to whether funds would be available to meet the requirements. The practice of meeting deficits of bad years from earnings of prosperous years is becoming common, but it necessitates more careful management so that cash will be available when needed. Even this, however, does not eliminate all of the uncertainty where earnings fluctuate greatly.

The significance of the size of the factor of safety is also affected by the rapidity of the growth of a business. Where earnings tend to increase over a considerable period of time, the factor of safety need not be so great as if earnings were constant or decreasing. A well-established

¹ See LAWRENCE CHAMBERLAIN, *The Principles of Bond Investment*, p. 277

concern which has shown steady growth and whose management keeps abreast of the times is a better risk than a new concern which has yet its place to make. The factor of safety on real-estate mortgages in cities of large size and steady growth may be much smaller with equal safety than similar mortgages in smaller cities whose future growth is a matter of uncertainty. A railroad with increasing earnings located in a relatively new territory whose future is assured would show an increasing factor of safety from year to year and would require a relatively small margin for a given degree of safety.

According to the moving-basis method of calculation, the degree of risk indicated by a given factor is greatly affected by the position of the security in mind. The closer to the ground the security lies, the less will be the risk with a given factor. Underlying railroad mortgage bonds are almost invariably safe, although the factor of safety may be no larger than that of weaker issues. Securities with the weakest claims need the highest factors in order to give reasonable assurance of safety. This is because a relatively small decline in gross earnings will absorb a large percentage of net earnings remaining after interest or dividend charges on all securities of prior claim have been met. In the example cited above, a decline of 5 per cent in gross may result in a reduction of 15 per cent in net income. This would leave only \$35 available for dividends on the common stock and would reduce the factor of safety from 40 to $14\frac{1}{4}$. The first-mortgage bonds, however, would have their margin reduced only from 80 to 76 $\frac{1}{4}$ per cent. An even more serious situation with reference to the common stock is revealed by the cumulative method of calculation. A reduction of 15 per cent in the net income available for capital charges would reduce the factor of safety from 20 to 5. Thus the percentage of the decrease in the available income is always accompanied by a decrease in the factor of safety equal to precisely the same amount. In this case a further small decrease in gross would wipe out the margin for common stock entirely while leaving the mortgage bonds almost entirely unaffected.

In practice, certain standards have gained more or less general adoption. It is usually said, for instance, that first-mortgage railroad bonds should show earnings at least two times the interest requirements in order to be safe. Some conservative issues may be found where the interest is earned five or more times over. Public utilities are generally mortgaged to a higher degree than railroads, and the factor of safety for the best bonds is somewhat lower, say, 2 to $2\frac{1}{2}$ times the interest charges, for the safest bonds. Industrial bonds, on account of fluctuation in earnings, require a higher margin of safety than either railroads or public utilities. The interest should in these cases be earned five or more times over on the average for the safest bonds. For preferred stocks of public utilities, dividend requirements after interest charges should be earned

two or more times over. In industrials the accepted figure is perhaps double this. All these standards, however, are more or less indefinite and are affected by circumstances surrounding each case. Mr. Moody states in *Analyses of Investments Industrials*, for 1923, that bonds having a factor of safety of 40 as an average over a period of years are in a really sound investment position; those having a factor of safety of 50 are much stronger, while those having a figure as high as 75 are really high-grade bonds.

The factor of safety for a single year tells but little. A conservative rule to follow is to require this figure for 10 years previous. Each year should stand by itself. Only in this way can the effect of fluctuating or changing earnings be seen. For example, suppose for a series of 5 years the factors of safety for a given issue are 40, 50, 80, 20, and 10. These show wide fluctuations in earnings, and the strength of the issue must be governed largely with the lowest factor in mind, which is 10. Yet the average of the figures for 5 years is 40, which is generally regarded as reasonably good. Again, arrange these figures in the following order: 80, 50, 40, 20, 10. The average is still 40, but the factor shows a dangerous decline. The credit of such an issue would be greatly impaired. If the figures be arranged in the reverse order, the average would remain the same but credit would be greatly improved. The average is, therefore, unsafe and obscures both the fluctuations and the trend which are highly important. These are revealed only when figures are available for each of a series of years. Investors should insist upon having the factor of safety for each year separately.

Future Income.—All financial and statistical analysis of necessity must deal with past experience, since the future is unknown. Yet past experience in itself is of no consequence and is valuable only as it throws light on the probability of future experience. But the experience of the past is the best guide for the future. With the trend of an industry or the position of a given company in the industry once established, a high degree of probability of the continuation of that trend is *prima facie* to be expected. The statistician's work on trends has made some progress toward establishing definite laws and the greater reliability of these laws, the more certain we feel as to the future. Nevertheless, statistical analysis is of itself not complete. If we supplement the work of the statistician with economic analysis, we are in a position to make the best estimate of the future. To take a few examples, the statistical trend of profits in the copper, sugar, and the coal industries was distinctly favorable until the World War brought an unusual capacity of production and materially changed the trends and then modified these by known economic changes which alter the course of future development. There can be no difference of opinion as to the primary importance of the future over the past, it is only as to the method of forecasting the future that opinions differ.

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CHAPTER X

THE ASSET ELEMENT OF CREDIT

The pledging of assets as security for loans is as old as civilization. From time immemorial, property has been regarded as the chief element in credit. So deeply rooted is the idea that loans reinforced by a lien upon property have come to be universally known as "secured" loans, as distinguished from loans on personal credit known as "unsecured" loans. Secured loans are everywhere regarded as safer than unsecured loans. The financial histories of the leading types of corporations, railroads, public utilities, and industrials, tell similar stories. Whenever it became necessary to ask for funds from the public, adequate property protection was invariably demanded. The most desired type of investment security today is the first-mortgage bond or its equivalent based on assets of unquestioned value. Such loans on account of their strength are the cheapest form of borrowing available to the corporation that is fortunate enough to possess unencumbered property for this purpose. Furthermore, such securities are preferred over all other corporation securities by the laws of the various states regulating the investment of trust funds. The loan which is well protected by assets of high quality and otherwise not defective represents the safest corporate security today.

Importance of Assets Underestimated.—The advance of the corporate form of business organization with the large masses of capital used in production has strengthened the asset element of credit rather than detracted from it. With the coming of railroads, a new form of property came into existence. At the very beginning of railroad construction, the mortgage lien upon the right of way and road itself was practically the only method by which money could be secured to complete the undertaking. Today, railroad property of varied description is mortgaged to the hilt, and, except equipment obligations, the first-mortgage railroad bond is without doubt the premier corporate security. Adherence to the principle of physical valuation of assets in rate-making and capitalization is now a settled policy of the federal government. Public utilities have recently duplicated the history of railroads. Their property has been pledged even to a greater extent than that of railroads, and it is fast becoming a matter of law and the policy of regulatory commissions to limit the earnings and capitalization to a reasonable amount based mainly on property considerations. The securities of industrial corporations are late-comers in the field of investment, although these concerns came first

in the history of industrial development. The mortgage bond here as elsewhere bears the highest rating of all the corporation's securities.

The asset element of credit, therefore, is more firmly imbedded in investment practice than ever before. Few investment loans are made nowadays on purely personal security, but everywhere there is the insistence on adequate property protection back of every investment issue. No investment banker today would float a purely personal loan. While the contractual features of the different types of investment issues change in almost kaleidoscopic fashion, they represent only imperfect attempts to secure, amidst an ever-changing economic environment, the reinforcement of credit through adequate property protection. The scrutinizing examination by engineers and auditors to which investment bankers subject the assets of prospective borrowers, the carefully prepared balance sheets now being required of their customers by bankers in the commercial field, the principles of property valuation set forth in the new Federal Farm Loan System for agricultural credit, the emphasis that the Interstate Commerce Commission and public-utility commissions are placing upon assets of companies engaged in public service in their rate schedules, these are the strongest and most convincing proof of the high regard in which the asset element of credit is held today.

Importance of Earnings Overestimated.—The underestimation of the importance of assets in credit has been accompanied by a corresponding overestimation of the earning capacity. There are two general reasons for this: one has as its basis a well-known economic principle, and the other is closely allied with modern methods of production and finance. The first rests upon the misapplication of the principle of the usefulness of capital in production. Few economic truths are more fundamental in character than that which assigns the ultimateness of the cause of capital and land values to the productive usefulness of these agents. In spite of the ultimateness of its character, no more fundamental mistake could be made than the unreasoned application of this principle to investment matters. Nevertheless, unless one is constantly on guard, one is likely to fall into a sort of economic lock-step which links in an unvarying ratio capital value with earning capacity. Such a mental attitude naturally leads to, and in fact has already produced, unsound analysis of the role played by capital in modern production.

The second reason for the underestimation of the asset element of credit is found in modern methods of production and finance. Nowadays great aggregations of capital are necessary to make up the business unit of greatest efficiency. This has necessitated the raising of more and more of the funds of industry from the public, a public which for the most part is dissociated from any function in management. This has brought about an ever-decreasing margin of safety in capital values in comparison with securities outstanding. The margin of safety has grown progres-

sively thinner, while in many cases it has entirely vanished. The holding company device still further reduces this equity by permitting the managers to control industry with only a small amount of invested capital on their part, depending almost entirely upon the public for the necessary capital. With assets completely utilized for obligations already outstanding, corporations have frequently found it necessary to lay great emphasis upon other elements of credit, notably earning power. A sanction was sought in the economic truism that capital is valuable because it is of service in production. It is more assuring to follow the course of the courts, commissions, and statutes in this matter, regardless of whether the property be that of a corporation devoted to the public service or engaged in mercantile or manufacturing operations.

Nature of Assets as Security.—The pledge of assets as security is in the nature of a guarantee. Like all guarantees, the pledging of assets is for the purpose of giving assurance. In the event that other means fail in the payment of obligations, the creditor has certain assets to fall back upon. So long as the corporation continues as a successful concern, paying all of its obligations as they come due, the guarantee of assets need not be invoked. But when earning power fails, or bad faith creeps into the affairs of the management so that important covenants are broken, the creditor is then compelled to resort to the property of the borrower in order to secure his claims. While the fundamental purpose of the contract is to give priority of claim and facilitate legal action, the assets of the debtor are necessary to give content and meaning to the legal guarantee. No matter how flawless the contract may be, it is unavailing in the absence of valuable property.

It is not difficult to confuse the contract with the assets which it covers. Sometimes the weakness of an investment issue is attributed to the lack of assets or to their inferior quality. An issue is strong or weak according to the likelihood of payment of the principal. The mere possession of sufficient assets is strong presumption that the principal of a loan will be paid when due. The quality of the assets determines their convertibility into cash. It has already been explained that money is the premier form of property which guarantees ability to pay, and contracts are ordinarily made in terms of money. Debenture bonds are usually based upon current assets which for the most part are constantly flowing through the business and being converted into cash. Because such assets are not fixed in character, it becomes a legal impracticability to mortgage them. Yet, if the investor had some method of assurance that the funds represented by such property would be available to him for the satisfaction of his loan at maturity, it would furnish a strong basis for credit and in some cases even a stronger one than fixed property. The weakness of debenture bonds is not in the lack of assets but in the defectiveness of the contract. Recent covenants, already referred to, having to do with current

assets, are an effort to strengthen the contractual features of debenture bonds

Assets in Liquidation.—The assets of a concern are depended upon in the event of reorganization or liquidation to satisfy the claims of the creditors and stockholders. They often furnish the sole means of satisfying a debt. This is particularly true with reference to real-estate and farm mortgages, where failure occasions strenuous measures on the part of the creditor. Since they render a service which cannot be dispensed with under any practical consideration, railroads and public utilities are seldom subject to liquidation but are frequently reorganized, whereupon, if the property is sufficient and the undertaking has potential earning capacity, the assets again furnish the sole dependence of the creditors in the financial realignment. The assets are then distributed in the order of the claims of the different classes of security holders and general creditors, or the property is sold to a new company at an "upset" price fixed by the court in consultation with the parties concerned, the proceeds are then used to cancel the obligations of the liquidating company, which goes out of existence. In this case, however, creditors and stockholders usually receive, in exchange for their claims, securities in the new organization according to the strength of their contract and the economic position of the property covered. In any event, if the property is sufficient, no sacrifice is necessary, since claims will ultimately be made good. But if the property is insufficient, the weaker security holders will be compelled to forfeit some or all of their holdings. Industrial corporations are often liquidated because their business is not so indispensable and the courts are not so lenient in dealing with them as with public-service corporations. If conservatively written, issues based on industrial assets may prove to be strong investments.

Asset Values.—Asset values present several characteristics of importance in credit analysis. The first is that assets must be adequate in amount for the purpose in hand. In addition to this they must possess the qualities of permanence and stability of value if they are to rank the highest. Adequacy of asset values is treated under the topic of margin of safety. Stability and permanence of value depend primarily upon two things, the physical nature of the property and various economic considerations. Some forms of capital, such as land, canals, tunnels, artificial harbors, and roadbeds of railways, have an indefinite physical existence, while others, among which might be mentioned coal taken from the mine, iron exposed to moisture, and automobiles, are subject to decay and deterioration. Still other forms, such as mineral and oil resources and raw materials of various kinds, are continually being used up in the process of production and manufacture. Whatever the kind of property or the cause and rapidity of depreciation or waste, it cannot possibly retain its value for a period longer than its physical life. The

security afforded by assets cannot, therefore, extend beyond their physical existence

Most forms of capital, however, lose some or all of their value long before their physical deterioration is complete. Changing methods of production, new inventions, and improved processes are continually rendering parts of the industrial equipment obsolete or inadequate. The natural wear and tear of industrial operations is, furthermore, sending its continuous stream of worn-out machinery and equipment to the junk pile. Buildings become obsolete when out of harmony with their surroundings and have to be demolished long before their physical life is ended. The value of industrial equipment, therefore, must be carefully distinguished from its physical existence, the former usually will be found to be extinguished many years before the latter.

Value and Price.—Broadly speaking, value itself depends upon two sets of forces continuously present and operating to influence the final result. Value in this sense is synonymous with the word price. Neglecting its financial or monetary expression, economists define value as the ability of a given commodity to command other commodities in the market. This is the exchange value or the concrete result of the division of labor and the exchange of goods which are the basic facts of modern production. The value of a commodity in this sense depends upon relative conditions of supply and demand. Scarcity of a particular commodity will invariably result in an increase in its value or ability to command other goods, while an abundance of supply will invariably depreciate its value. On the other side of the equation are changes in the demand for a particular commodity which affect its value in direct ratio to the extent of the change. These are the fundamental facts of market value. Changes in the cost of production influence value only to the extent that they alter the supply, for every commodity must have a market and can be disposed of only in accordance with the social demand schedule. To know values, then, a knowledge of the forces that control the demand for and supply of a commodity is the first essential.

The prices of commodities may change, however, independently of alterations in the relationship between demand and supply. Value is often used in the sense of price, and there is no harm in this usage when properly understood. But one must be on one's guard not to confuse value in this sense with value used in the sense explained in the preceding paragraph. The prices of commodities, independent of values, are constantly changing. Such changes in prices are measured by taking the average price of hundreds of commodities and comparing the results from one period to another in terms of either absolute figures or percentages. These are the index numbers of prices which are now so widely quoted. The most useful indexes in the United States are Bradstreet's, Dun's, and the index compiled by the Department of Labor at Washing-

ton Most index numbers are based upon wholesale prices, although retail index numbers are now receiving more attention than formerly

The cause of change in the average price or index number is not to be sought in the equation of demand and supply but in currency conditions. It would divert the attention too far from present purposes to give this matter adequate treatment, but the essential truth may be set forth in a short space. Changes in the currency come through changes in the supply of gold, silver, or other metals used in coinage, they come also through the issue of government paper money or bank notes. In a broader sense, currency also includes bank credit in the form of deposits. Undue expansion of the currency at any point may result in inflation and show itself in a more or less permanent rise in average prices as revealed by the index numbers. Easy money and easy credit are invariably accompanied by increase in prices, while a loss of gold or tightness in credit conditions just as surely results in falling prices. Sooner or later practically all commodities will be affected to some extent by changes in the currency.

Average price movements, which are those due to changes in the currency, must be considered from two different points of view: those manifesting themselves over long periods of time, or the secular trend, and those showing themselves in shorter periods, or cyclical changes. Changes running over a long period of time sometimes extend over the entire period of one's active life. Since the Civil War there have been three such changes: the first was a period of falling prices extending from 1873 to the end of the nineteenth century, this was succeeded by a period of rising prices extending down to 1920, since then the price trend has again been downward. The comparatively slow increase in the currency, combined with the extraordinary growth of the country, were the causes of falling prices during the first period, the increase in the currency and expansion of bank credit at a more rapid pace than the growth of the country from 1897 to 1920 explain rising prices in the second period. The fall in prices since 1920 has been due to world-wide shortage of gold to support the inflation of the war period.

In periods of rising prices, asset security has the effect of continuously increasing the equity back of the investment, for while the property rises in price the face of the loan remains the same. In a period of falling prices, the opposite is true, for the price which property commands is constantly falling but the face of the loan remains constant. In the one case the equity back of the investment constantly increases, while in the other it constantly decreases. Changes in the currency over a long period of time, however, are almost unpredictable. New gold may at any time be discovered, or new processes, such as the cyanide process which makes the mining of low-grade ores profitable, may have the effect of materially increasing the supply. The international flow of gold has

its effect upon the supply in a particular country. Likewise, changes in the banking system, such as came about with the establishment of the Federal Reserve System, are responsible for decided changes in the currency and hence in prices. While the investor must constantly bear long-time changes in mind, he cannot always predict with certainty what the movement over the next decade will be.

Long-time changes in values are brought about also by changes in the relation of a particular commodity to others. Fundamental conditions affecting a given commodity determine the course of its value as compared with other commodities. Farm land has shown a steady rise in value because of its ever-increasing scarcity and a growing population. City real estate in general exhibits most astounding strides in value, owing to the rapid growth of urban communities. In the field of reproducible commodities, increasing costs and consequent curtailment of supply have been responsible for upward movements in values, while in other cases progressive increase in demand, accompanied with wasting supply, as in the case of lumber, for instance, has added to the cost of construction. Long-time changes of this character can be reasonably well predicted by a careful study of conditions affecting the situation. Account is frequently taken of changes in individual kinds of property in the making of securities. Witness the high percentage of valuation allowed in the writing of real-estate mortgages in some of the large and rapidly growing cities. The probability of a rise in value will add to the safety of a security, while the probability of a fall in value will render it more risky.

Specialized and Non-specialized Assets.—The distinction between specialized and non-specialized forms of capital plays an important part here. Assets which are not too highly specialized may be used in several ways without greatly detracting from their value. Assets such as land and certain types of building and equipment show relative stability of value when compared with other types. Their value is on this account dependent only to a limited extent upon current employment. The divorce of a particular management from this kind of property is of only small significance.

Luxuries and Necessaries.—Goods may also be distinguished on grounds of their usefulness. Those essential to life maintain their value much better than mere luxuries. Property used in transportation serves an essential process of life, its service consists in conveying passengers and hauling freight, both of which are essential to all classes of people. In deciding what is a necessity, care must be taken to interpret the term broadly enough so as to include social as well as individual necessities. Living in the advanced stage of existence known as pleasure economy, the demand for social necessities is quite as persistent as that for individual necessities. The instinct of keeping up appearances generally persists long after the exhaustion of means. The earnings of

companies engaged in the production of commodities of the types suggested above show a constant increase from one decade to another. Investments in assets of this character are much safer than those used in the production of goods of less insistent demand.

Price Changes in the Business Cycle.—Aside from long-time movements, fluctuations in average prices of shorter duration occur, due chiefly to the rhythmical movements of the business cycle. These movements extend over periods of only a few years, the tendency within the past two decades being to shorten the period. The fluctuations in price are due to very much the same causes as in the case of permanent changes, except that greater emphasis must be laid upon the fluctuations in demand and supply than in currency changes. Cyclical changes, nevertheless, are influenced to some extent by currency changes, as when a fresh supply of gold suddenly appears on the market. This furnishes a basis for increased bank expansion and forces a drop in bank rates. Nevertheless, except in times of financial stringency, there is almost always a surplus of bank credit at the disposal of business. It is only when this is accompanied by favorable business conditions that prices move upward and prosperity reigns.

Not all goods increase in price with the same rapidity, nor do they advance to the same extent during the course of the cycle. Much study has been given this matter, and, while the conclusions are still of a tentative sort, some tendencies are evident. Goods have been classified into various groups based on the degree of fluctuation in their values. The broadest classification is perhaps the division of commodities into consumers' goods and producers' goods. Business cycles and panics have less influence on the value of consumers' goods than upon the value of producers' goods. This is doubtless the result of the steady demand on the part of the general public for this class of commodities. On the other hand, when fluctuations in business conditions bring about alternating periods of prosperity and depression, profits fluctuate accordingly. This creates in times of prosperity a large demand for construction material and equipment in order to take advantage of high profits. During periods of depression business is slow, profits are niggardly, or actual deficits occur, business men curtail expansion of plant and newcomers are deterred from entering the field.

A second division is that between retail and wholesale prices of goods. Retail prices show far greater stability than wholesale prices. The nearer to the ultimate consumer goods are, the more stable are values. This is largely because of the high overhead expenses and slow turnover among retailers as compared with wholesale establishments.

A third division of importance is that between raw materials and finished products. The primary metals, such as copper and iron, and agricultural products, such as wool, cotton, and wheat, show greater

fluctuations in their value than the finished products into which these materials have gone. The greater the percentage of the value of the finished product represented by the cost of the raw materials, the more is the product likely to fluctuate in value. This is because of the fact that such goods can be later replaced out of new raw materials at greatly changed prices. The producer is, therefore, out of fear of competition, compelled to dispose of his product as best he can. On the other hand, when the overhead, labor, and other direct expenses, aside from the cost of raw materials, constitute a large percentage of the value of the finished product, these items under renewed production will not show great variation in cost, the product, therefore, will not be disposed of at great loss. Concerns with large inventories of raw materials and semi-finished products suffer most in times of industrial depression and panic.

Fixed Assets.—Fixed assets include real estate, plant, equipment, and so forth. These items often appear in a single total, so that it is impossible, on the face of the statement, to tell how much of the total value is represented by each component part. Furthermore, it is often the case that intangible property, such as patents and good-will, is included in the same property item. Such practice of accountancy is to be condemned in the severest terms. The first essential of clearness in balance sheets is the division of the property into significant items.

The valuation of assets is as important as the separation of the different items. In the case of public-utility and railroad companies, property valuations are fixed by public commissions, and the investor can usually do no better than accept these figures. In the case of industrials, however, where no public control is exercised, no consistency in valuation is to be looked for. The published figures may represent cost with or without depreciation or merely an arbitrary or nominal value. In some instances, for the purpose of balancing heavy liabilities of various description, chiefly stocks and bonds, they may even represent a marked-up or appreciated value which may or may not have any justification in actual fact. From the point of view of the investor, fixed assets may properly be entered at a figure which represents a conservative estimate of their permanent value. In fact, if this is not done, the public is often deceived as to the equities lying back of securities. Writing up of plant values when prices are advancing rapidly, however, is an unsound practice, because when the inevitable crash comes these values will crumble away in an instant. On the other hand, if through inflation prices are on a permanently higher level, the investor who neglects to take account of the change in currency as represented by higher prices neglects a new element of value in the increased equity back of outstanding issues. Increased equities of this sort are chiefly beneficial to stockholders because their claims are residual in character.

Fixed assets may represent fictitious values resulting from the inclusion in the figures of organization expenses, outlays of advertising at the time of promotion, services of the promoter, repairs, maintenance, and so forth. A construction company may have built the plant at an exorbitant cost which is included in this item of the balance sheet. The investor is generally at sea unless he takes the time to make proper investigation, which he rarely does. He is far better off if he takes the figures of an investment banker who perhaps was at one time interested in the flotation of some of the securities of the company. These are by far the most dependable sources of information and the estimates contained therein are likely to err on the side of conservatism rather than on the side of liberalism.

Whatever the final figures accepted may be, they must always be corrected for depreciation, obsolescence, and inadequacy. Sometimes such accounts are carried and sometimes not. Reserves for these items are frequently carried in cash, but more often in the larger concerns they are invested in new plant and equipment. It matters little which method is used as long as the management does not dissipate these funds in speculation or otherwise. Many investment contracts contain provisions relative to the maintenance of property. These are healthy provisions and should always be present where the nature of the property permits their observance. Many a concern has been vain enough to imagine its plant and equipment so well maintained that depreciation may be neglected. Likewise, many a crash has come when an impartial audit reveals plants ready for the junk heap through natural wear and tear, obsolescence, or inadequacy and which are still carried on the books at undepreciated, or improperly depreciated, figures.

Wasting Assets.—Accountants have spoken of wasting assets, having in mind assets which of their nature gradually become exhausted. Such are the ores of all kinds of mines, oil resources, timber, and so forth, all of which constitute resources which it is the object of corporations to exploit and exhaust. The extent of the mineral resources contained within a mine can often be determined by the engineer, in many cases, however, the extent of the deposits is extremely uncertain. Copper mines come under the first class, while gold mines and oil wells seem to come under the second class. In all cases where corporations are organized for the purpose of exploiting resources which decrease in amount in direct proportion as operations proceed, the asset security diminishes in the same ratio. It is usually the case that corporations engaged in this type of business have in addition to their natural resources expensive plant, equipment, and machinery. The point cannot be too strongly emphasized that the value of all this property is dependent upon the supply of natural resources and, when exhausted, its value becomes little else than that obtained for the equipment if sold for junk. It is of the highest impor-

tance, therefore, that the amount of deposits be known, and the length of time which the present rate of operations will take to exhaust entirely the known supply. Securities based upon wasting assets must have adequate provision for their retirement well within the period of their exploitation, if they are to possess a high degree of asset security

Current Assets.—All tangible assets which are not classed as fixed may be included in the term current assets. Current assets are constantly changing. Raw materials are being worked up into finished products, supplies are consumed and new ones taking their place, accounts are constantly being liquidated, and notes paid off. Quick assets usually include only that portion of current assets that can be readily converted into cash. Cash itself is the only example of a perfect quick asset. Contrary to actual practice, investment stocks and bonds may also be included in this term, especially if there exists a broad market for them so that they may be disposed of at will. Whether notes and accounts receivable are readily convertible into cash depends largely upon the type of customers with which the company deals and, also, the state of business. Periods of prosperity reveal a large amount of slow assets among the current assets.

Cash.—The cash item should ordinarily mean money. Yet it is sometimes the case that this item is made to include worthless checks, from both customers and officers of the concerns, perhaps purposely written to cover up losses. Notes are sometimes wrongly included in the cash item. Accounts receivable possess different degrees of liquidity. A good index here is suggested by Lincoln, in his work on *Applied Business Finance*, by comparison of the turnover of accounts with the turnover of inventory. When the accounts receivable show a relatively rapid turnover with reference to inventory, they are probably in a healthy condition. If the relation is low, it is probable that there is some unsound element in the case. The company may have a lax credit policy or the item in this case may include old and worthless accounts. Notes or bills receivable are sometimes of questionable value or liquidity. If it is the custom of the business to sell on this basis, as is the case with agricultural implement companies, musical instrument manufacturers, and automobile dealers, and if the turnover is reasonably rapid, these items may be of fair to high liquidity. On the other hand, they are more likely to represent overdue accounts receivable of some time standing, or intercompany notes, which in both cases are of doubtful ultimate value and of still more doubtful liquidity. Such items as deferred assets, suspense accounts, insurance, bond or stock discount, and the like, are probably of very little significance to the investor and usually should be neglected unless they are of more than ordinary significance.

A company's cash position is of crucial importance. It is by means of cash that interest on borrowed funds and dividends on stocks are paid

Periods of liquidation and falling prices, precipitated by financial stringency, slackening trade, and decreased purchasing power on the part of the public, put to severe test the management of business concerns. It is then that overstocked inventories, accumulated in the period of prosperity immediately preceding, clog the supply of cash. Such periods are invariably accompanied by tight money conditions, making it difficult for even the well-ordered business to secure cash. Interest payments and dividend disbursements frequently drain to the very bottom the available cash. At such times even though the balance sheet shows large current profits, it may be entirely impossible or, more often, very unwise to pay out dividends, thus depleting the business of its cash surplus and handicapping it for business operations. A low treasury at such times is even likely to precipitate receivership on account of inability to meet interest requirements or maturing short-term obligations. Sufficient emphasis has rarely been placed upon this part of a corporation's finances in periods of depression. Most failures in the commercial world are due to financial rather than to business causes. Bad financing or insufficient cash is the root of the trouble. Investors will do well to investigate the record of a corporation with this in mind before purchasing its securities. The lessons of 1920 taught many a management to conserve its cash. The relation of cash to sales and working capital when compared over a series of years is a valuable index to the efficiency of the management.

Inventory.—Under the term "inventory" are included raw materials, partially fabricated products, finished goods, and stock in trade. Materials for other purposes than these, such as construction materials, should not be included under this item, they probably belong to an independent plant construction account. Likewise, tools, machinery, and other apparatus used in the process of manufacture or trade belong to the equipment or other account.

In the valuation of inventory, the commonly accepted practice is to assign a value to this item equal to the cost or market price, whichever is lower. In the case of goods under process of manufacture the prevailing practice of calculating cost is to count only the direct expenses incurred for labor, consumption of raw materials, and so forth, up to the given stage of completeness. While this seems to be a conservative rule to follow, it may under certain circumstances prove to be unsound. Inventories valued at market price in a period of rapidly declining prices are almost sure to be worth less a few months after the balance sheet has been struck off. The better rule for the investor to follow would be to take an average of inventory account over a period of at least five years, and this rule if applied by the accountant would also have a healthy effect upon the management of the concern. In the interest of conservatism, it would be proper to still further reduce the figure by an arbitrary percentage, say, 25 to 50, depending on the nature of the inventory.

Effort has been directed in the past in many instances to preserve a direct relation between the maturity date of a bond or note and the physical or economic life of the assets upon which it is based. It is ordinarily considered a good principle not to extend the life of the obligation beyond the life of the asset and still more conservative to fix the maturity date some time ahead of the probable time when the asset will become useless. In order to provide against the gradual depreciation of the asset, various expedients have been employed. Among them are the maintenance of a depreciation account sufficient to liquidate the obligation at maturity. Serial issues, parts of which mature annually, and sinking funds which accumulate funds partially or wholly sufficient to cancel the entire amount of the obligations at maturity, are also among the more important expedients to bring about the desired result. Recently, in the financing of industrial concerns, many attempts have been made to introduce new methods of assurance to the investor whose obligation rests on current assets.

In a larger way this involves the question of permanent or limited debts. It needs only to be recalled here, however, that the earlier conception of the definite payment of corporate debt has largely given place to the newer idea of its essential permanence. This, of course, demands that proper safeguards be contained in the contract between the investor and the company. Contracts which secure the debts by pledge of resources to all intents and purposes permanent in character, such as most city real estate and farm lands, are comparatively simple, conveying title conditioned on the non-payment of the obligation. This sort of a contract, however, is impossible in the case of assets whose life gradually expires or current assets which constantly change in the regular conduct of the business. Investment issues here must be debenture bonds or notes, or stocks, especially preferred. It is clearly impossible to attach a lien to assets that are constantly shifting in the regular course of business. The chief concern in such cases is that the company continues to show assets sufficient to cover the issues with the usual liberal margin requirements. If this could be assured, there is no reason why issues based upon current assets should not be fully as safe as those with definite lien on specific property. There is no reason either in such cases why the obligations should not be of a permanent character.

Whatever the nature of the contract, whether it conveys conditional title to some parcel of property or contains provisions requiring a certain ratio between current assets and current liabilities, or some other provision, the ultimate security of an investment, the last line of defense, will usually be found in the convertibility of assets into cash. Otherwise, the mere possession of property as security would in our modern economic organization be only mockery. Land that cannot be disposed of is the proverbial dead asset. In order to vitalize it, frequently great sacrifices

are made with reference to its value for the sake of obtaining immediate convertibility into cash

If this is the ultimate test of the significance of asset security, it should also be applied to current assets. In the first place, current assets are generally far more liquid than fixed property. Cash, that is, money, or its equivalent, is the safest form of investment. All contracts are made in terms of the standard money of a country and payment of both interest and principal, sinking-fund requirements, and so forth, must be made in the standard money. Since current assets are more readily convertible into cash than fixed assets, the conclusion cannot be avoided that current assets may become the most desirable form of asset security. This is especially true of short-time obligations. Here as elsewhere there must be observed the proper margin of safety. Obligations resting upon a 100 per cent valuation of current assets may be no better or worse than an obligation resting upon a similar valuation of real estate. This is a matter wholly independent of the question of the appropriateness of certain assets to serve as a basis of credit.

Current Assets as a Basis of Credit.—The really important question with reference to current assets relates to guarantees to the effect that a proper amount will be maintained at all times to preserve the equity back of the investment issue. It is said that current assets are subject to dissipation and, therefore, should not be used as a basis of security. It should be recalled that the same holds true of real estate and other fixed assets. Familiar instances of railroad property being neglected for years at a time and thus undermining the equity back of mortgage issues will come to mind at this point. The same course is possible and often occurs in case of industrial concerns which have written first mortgages upon their plants. It should be recalled, also, that the large issues of debenture bonds of many classes of corporations rest largely upon current assets without any protective features in the contract. The reputation of the company issuing these obligations has heretofore constituted the chief guarantee that the property lying back of the issues will not be recklessly handled or dissipated. The author sees no reason why with proper safeguards obligations should not be written with current assets as a basis of credit. It is entirely possible that, after the novelty has worn off, this type of security will take its place alongside of other securities which themselves earlier traveled the same unpopular and unfamiliar road.

Investments.—In the balance sheets of many concerns, particularly railroad and public-utility holding companies, occurs the item of investments. The assets of some of these companies are composed almost exclusively of stocks and bonds, while in others the amount is more modest but still sizable. It is always a matter of uncertainty as to the basis of the figures given. They may be entered at purchase price, at par, or at the market price at the time the balance sheet is made up. There

is no one right way of handling this kind of asset, the principal caution should be rather to make plain to the investing public which method of valuation is used. If market value is used as the base, the date of the statement is of the greatest importance. The cyclical movements of security prices, especially stocks, vary so widely that the market price at the time the statement is made out may be very different a few months later. Whatever base is used, some authors advocate a depreciation or discount account to offset possible shrinkage in value. Investment items may be held as temporary or permanent investments, or they may represent holdings of a parent company in subsidiary companies, in which case they are of the nature of fixed assets and should be thus treated. Their value in this case is often difficult of determination, since it depends on the underlying properties of the subsidiaries. Where an issue is listed on some stock exchange, it is not a matter of great difficulty to discover its value. In case of a holding company statement, the financial condition of the subsidiary companies must be carefully examined to determine the value of this item. It is sometimes the case that initial expenses of organization, advertising, and the like, are concealed by this term, in which case little or no value may be attached to the item.

Treasury stocks and bonds sometimes appear as assets. This item when correctly treated includes only stocks and bonds of the company itself which have been repurchased by the company or donated to it by their holders as in the example of Sears, Roebuck and Company. Authorized but unissued stock should never be included in the item of investments. It is just as wrong to include it in current assets. Treasury stock may be and often is resold to the public, in which case it has the same effect on the company's finances as the sale of new stock. Treasury bonds are usually acquired through the operation of a sinking fund. Sometimes preferred stock is treated in the same way. As stock cannot legally be sold below par, the promoter is sometimes presented with large blocks of it at the time of promotion which by previous agreement is immediately purchased by the company for a nominal consideration, whereupon it becomes treasury stock and can then be legally sold at whatever price it will bring. In every case this item will bear rigid investigation before assigning a value to it.

Intangible Assets.—All of the assets discussed above are sometimes spoken of as tangible assets. Other assets, including good-will, going value, patents, franchises, permanent advertising, and so forth, are frequently spoken of as intangible assets. These are highly unsatisfactory for the most part for the purpose of supporting security values. Indeed, they represent economic value to business concerns, often forming their most valuable possession. It will be found, however, that their value is generally dependent either upon some competitive advantage to their possessors or upon the absolute monopoly which they create. They

come under the class of specialized forms of property, and their value is in many cases exceedingly ephemeral in character. Patents, copyrights, and franchises represent monopolistic privileges, while good-will and going value are inseparable from the organization itself. Intangible assets must have a commercial or exchange value before any allowance can be made for investment purposes. Balance sheets of corporations containing large items of any of the above or similar assets should be carefully scrutinized by the investor. It is too often the case that both tangible and intangible assets are lumped together in a single item of property account. In order to form an intelligent estimate of the value of property suitable for investment credit, it is indispensable that the property account be broken up into its chief elements.

Margin of Safety.—By margin of safety in assets, reference is made to the excess in the value of the assets over outstanding issues of securities. To one who is in the habit of neglecting asset values in investment calculations such a conception appears worthless. A satisfactory relation of outstanding issues to assets is, nevertheless, invariably demanded by investment and commercial bankers alike. The current ratio of the commercial banker has become almost a fetish and even in its crude state of development is an invaluable requisite of credit. If investment issues were expected to be of a uniformly high degree of safety, some such ratio might long ago have come into practice among investment bankers. But investment securities bear different degrees of risk, and the task of the analyst is not only to establish a safe ratio but in addition to assign a degree of risk to an issue with a given margin of safety.

The method of calculation is important in determining the significance of the margin of safety. Suppose, for instance, a corporation possesses, on a sound valuation, fixed assets to the value of \$1,000,000, against which it has first-mortgage bonds outstanding amounting to \$500,000. The excess of fixed assets over the bond issue is \$500,000, or a margin of safety to the extent of 50 per cent of the property. Suppose, also, that the corporation had outstanding a second mortgage on the same assets amounting to \$200,000. The excess of assets over total bonds would now be \$300,000. Since the terms of the contract give priority to the first mortgage over the second, the \$300,000 excess value in no way affects the first-mortgage issue, its margin of safety remaining 50 per cent as before. The margin of safety for the second mortgage, according to one method of calculation, would be 30 per cent since \$300,000, the excess of value over total bond issues, is 30 per cent of \$1,000,000. Another method of calculation would yield an entirely different result for the second-mortgage bonds. If the amount of the first bond issue be deducted from the total value of the fixed assets, \$500,000 will remain for the second issue; \$300,000, the excess value of the property above the first bond issue, is 60 per cent of the amount of the property in excess of the

first bond issue, which may be taken as the margin of safety. This result, however, is fallacious. It neglects the fact that \$500,000 excess of assets over the first-mortgage bonds is unavailable for satisfying second-mortgage claims until after the claims of the first-mortgage bondholders have been met. The first method of calculation, the cumulative method, is the correct one, since the degree of safety of the second issue may be determined only by the excess value after all prior claims have been met.

The general rule for the calculation of the margin of safety requires that all issues of equal rank or priority be considered together, and for the calculation of the percentage of margin of a given class of securities must always be included, also, all senior issues. According to this principle, first-mortgage bonds stand in a class by themselves, next would come all second liens, then third liens, and so forth, after which would come debentures no matter what the name of the issue may be, they would be followed in all probability by bank loans and current obligations of various kinds, after which would come preferred stock and, lastly, common stock. The precise order of the claims has been discussed in the two preceding chapters.

In practice, different percentages for margins of safety have been developed for the better classes of securities, but the entire matter of standards needs much more study and consideration than has heretofore been given to it. For instance, in first-mortgage public-utility bonds the factor of safety for the best issues ranges from 50 to 25 per cent, while debentures would fall short of absorbing the entire excess of value. Preferred stock in public utilities ordinarily will not greatly exceed the remaining value of the plant, while common stock depends upon current assets or, perhaps, as often, it has no equity back of it at all and is simply watered stock. Railroad standards in practice do not differ materially from those of public utilities, except that in most cases the common stocks of railroads have an actual margin of safety, which would be less common in public utilities. In industrial corporations bonded indebtedness has not until recently been very popular, and the practice differs so widely that no real standards can be said to have been established. It is quite generally agreed, however, that the margin of safety must be much higher than either in railroads or public utilities.

The ruling principle in seeking to establish a margin of safety may be inferred from the discussion of asset values above. The more permanent and stable the value of the assets, the smaller the margin required in order to secure the desired degree of safety. If a 50 per cent margin is necessary for railroad issues of high rank, a much higher margin would be required for industrial issues of equal rank, since the latter's property as a rule shows greater fluctuations in value. City real estate, on account of its permanence and tendency to increase in value, could with equal safety be

mortgaged as high as 60 per cent of its value. Readily marketable staple commodities would require a much smaller margin of safety than a stock of rubber or silk. The length of the time to maturity will also be found to materially affect the result. Maturities of only a few months to run would not require in any case as large a margin as an issue of bonds with a longer time, say, 15 to 20 years, to run. The standards for all issues running longer than the average business cycle would in all probability not be very different regardless of whether they mature in 25 or 100 years.

Financial Ratios.—Just as was found in the case of the income statement, there are certain ratios in the balance sheet which are of importance in the analysis of investment credit. While some of the ratios are of more importance in analysis of short-time credit, nevertheless some are of considerable significance from the long-time point of view. These ratios reveal certain policies of the management and it is more in these established policies than in temporary situations that their importance lies for present purposes. Among the important ratios in this connection are the current ratio, ratio of cash and its equivalent to current obligations, and assets to capitalization.

Current Ratio.—The relation of current assets to current liabilities has long been emphasized by banks and credit men. Prior to the war the standard of 2:1 had become firmly established in credit circles. But in the post-war period business concerns became more conservative. A more normal ratio at the present time is 4 or 5:1 while many conservatively managed corporations show as high as 10:1. The facility with which bonds can be floated has brought about the change in this respect. Instead of depending upon the banks for current funds, business establishments have largely supplied their needs from long-time issues. The current ratio is of especial significance in manufacturing and mercantile concerns. It is of only minor importance in railroads and public utilities which render services but sell no commodities.

Earnings may be reported large and a satisfactory relation exist between profits and capitalization, and yet the business be in an unhealthy state should the working capital show a relative material decrease which would probably result from large current borrowings and bills and notes payable. To illustrate, suppose at a given date current assets stood at \$25,000,000, while current liabilities were only \$10,000,000. This would be a normal condition. But suppose during the course of the following year the figures changed to \$75,000,000 for current assets and \$60,000,000 for current liabilities. This could easily result from borrowing and tying funds up in inventory, which was the actual condition of many companies in 1920. In the first instance, the current ratio is $2\frac{1}{2}:1$; while in the second, it is only 5:4. This could have been made worse by taking account of heavy interest and dividend disbursements, so that

working capital might have vanished entirely. Of what value would it be to a company in this condition to show large earnings? With a depleted working capital, earnings are more than likely to prove only paper profits. The slump in inventory values in 1920 would have sent a company showing such a statement to the receiver's court. The principle of the maintenance of a high ratio of current assets to current liabilities is an absolute essential to business success. It is the ratio upon which bankers lay so much stress.

Cash to Current Obligations.—The ratio of cash and marketable securities to current interest and principal of maturing obligations is of the highest importance. Such a ratio may become of determining importance. As has already been remarked, failures are mostly of a financial rather than a business nature. A successful concern will always maintain sufficient cash or lines of credit in order to provide for all interest charges and maturing bank loans. Bank loans should not be extended indefinitely. Sound commercial banking practice demands that all loans be paid off at least once a year. Infringement upon this principle leads to overexpansion and often to absolute failure. Obligations must be met from cash. Contracts are drawn in terms of money and there is no escape from the obligation. The common stockholder is especially interested in the cash position of a company, for it is often decisive with a board of directors in influencing dividend action. In calculating the ratio of cash to capital obligations, it is best to include in the latter term all interest charges upon bonds and notes, including bank loans, regular dividend requirements, and current maturing obligations whether bank loans or investment issues. The latter may be excluded if large in amount and the credit of the company is good, so that refunding to advantage is possible.

Assets to Capitalization.—This ratio is of importance to the investor because it indicates the past policy of the management as to watered capitalization, if any, and, if none, it shows the margin of protection in both assets and normal earning power back of the capitalization. This is particularly important in industries which depend more upon assets than upon management for earnings. It is more important in railroads and public utilities than in industrials. Nevertheless, conservatively managed industrial and mercantile concerns will always be found to show a good margin of property over capitalization. Excess of assets over capitalization is generally measured by the amount of the surplus. This surplus is most generally built up out of earnings but sometimes stands as a capital surplus. The latter originates in the capital paid in at the time of organization or consolidation. More recently it has appeared through change in the par or stated value of capital stock. In any event, the margin of protection afforded by a favorable ratio of assets to capitalization is a bulwark of strength to the investor.

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CHAPTER XI

CONTRACTUAL ELEMENT OF CREDIT: BONDS AND NOTES

The two preceding chapters were concerned with the economic values that lie at the basis of all investments. One has now to discover the legal position of the investor with respect to these underlying economic values. When viewed from a broad standpoint, the machinery of government and law exists for the protection of individual property rights and freedom. It is not necessary here to portray the general principles of law that have been established through centuries of evolution calculated to secure individual freedom and protection to property. But we are especially concerned with certain specific legal provisions which define the rights and privileges of those who hold investment contracts. Inasmuch as every holder of a security becomes a party to a contract, it behooves him to become acquainted with his leading rights and duties under the various contractual provisions employed.

Evolution of the Contract.—In primitive times, it was imperative for each person to assume the care and responsibility of what little property he had accumulated. The embryonic capitalist of those days had to fight single-handed the enemies of economic progress. On the one hand, he was confronted by the natural forces of destruction and deterioration; while, on the other, were arrayed hordes of human beings prompted by ingrained habits of appropriation and pilferage and bent upon either annihilating property or wrenching it from its rightful owners. The instinct of rightful possession was still weak in the great majority of people, and its struggle for mastery over the forces of disorder and decay was long and bitter. In the meantime, the risks to life and property were extraordinarily great, and they were met as each person could best devise and employ his own protective weapons.

The greatest boon to economic advancement came with the organization of the state. This brought about the united effort of all the forces in the upbuilding of society. The state from the very beginning assumed what is still the elementary function of political organization, namely, the protection of life and property. Gradually through generations of organized effort, the right to property has come to be looked upon as one of the essential and sacred rights of civilization. Without this right, economic progress would be extremely limited, with it, advancement in the accumulation of wealth proceeds in proportion as it grows in strength. But the efforts of the state in this direction ended with the guarantee

of possession of property, no attempt being made to maintain its value

Long before the appearance of the organized state, men doubtless made agreements among one another. Where it was a matter of the simple exchange of goods, each party to the agreement made immediate delivery, and the transaction was closed then and there. But where one party made immediate delivery upon the promise of future delivery by the second party, a period of uncertainty intervened before the final consummation of the agreement. During this interval, the probability of final satisfactory settlement depended upon the moral integrity and ability of the party whose promise extended into the future.

Early borrowing doubtless took the form of surrender of certain kinds of property with the promise of return of either the identical piece of property or one of similar description. When money came into use, it greatly facilitated the transaction. Property could then be borrowed upon the promise of return of its value in terms of money. The final stage was reached when money was borrowed upon agreement to return a like amount, perhaps with interest added, at a specified time in the future. Thus money was borrowed and money was returned. What disposition was made of it in the meantime was of no special concern to the lender, his sole interest being in the restitution to him of the value originally surrendered. Borrowing and lending have thus come to be almost exclusively financial in their nature.

It was found that personal guarantee for the return of money on the part of the borrower was not always sufficient to protect the lender. Sometimes the borrower broke faith with the lender, whereupon he either skipped the community or remained and accepted social stigmatization, alternatives not unknown at the present time. Again misfortune sometimes overtook the borrower. In both instances, the lender lost. This was unsatisfactory and discouraged saving and the accumulation of property. The state, therefore, in order to give greater protection to those who had done most to further economic advancement assumed the duty of the enforcement of borrowing and lending contracts. Upon proper representation by the lender, the state undertook to use its power to compel the repayment of funds loaned to borrowers in default on account of inability, bad faith, or from any cause whatsoever. In case the debtor did not have sufficient means to satisfy the creditor, for many centuries the former was almost universally subjected to imprisonment. Where sufficient property was in the possession of the debtor, the state through its power compelled through civil action restitution to the full amount of the debt. A creditor may bring suit in a court to recover an honest debt, even though it deprives the debtor of his home and personal belongings above a certain minimum amount.

The last stage in the evolution of the investment contract was reached with the invention of the mortgage lien. The mortgage lien constitutes a legal claim upon the property covered by its terms as security for a debt. The property mentioned in the mortgage may ultimately be sold by the mortgagee to satisfy the debt. This is done through foreclosure proceedings which obviate the necessity of bringing suit at law to recover the debt. To insure priority of claim, the mortgagee is required to have the mortgage lien recorded by a court of jurisdiction. The property may then be transferred by the nominal owner to a third party without affecting the claim of the mortgagee, since the mortgage remains in force until the debt is paid or barred by law. The mortgage is to be looked upon, however, as subsidiary to the main contract wherein the promise to pay is found, and except where no note or bond accompanies it, the mortgage is not to be construed as interfering in the rights of the lender in bringing civil suit against the debtor for the recovery of the debt in case the mortgaged property proves inadequate to satisfy the claims.

Nature of Investment Contracts.—Investment contracts differ greatly in nature and length. A government bond, for instance, is a very brief agreement between borrower and lender; but a modern blanket railroad mortgage is frequently a formidable legal document of several hundred printed pages. The leading provisions are readily obtainable through investment circulars and advertisements and in the investment manuals and services such as Moody's, Poor's, Standard Statistics, and Fitch's.

All investment contracts are broader than the specific documents representing the agreement between the parties concerned. For instance, in the purchase of a civil obligation perhaps the main features of interest to the investor are nowhere to be found in the bond itself. They relate to the constitutionality of the issue, debt and tax limitation, validity, and the like. In the case of corporation bonds and stocks important provisions are found in charters and by-laws as well as in the general corporation laws of the states. The ultimate terms of all contracts must go back to state and national constitutions and laws, municipal charters, and court decisions.

Bonds versus Stocks.—From the legal point of view, investment securities are divided into two great classes, namely, stocks and bonds. Stocks carry proprietary interest with the privilege of participating in the management, while bonds are credit instruments, the bondholder occupying the position of lender and the maker that of the borrower. The interest of the stockholders in a corporation is a survival of the interest of the partners in a partnership. On the other hand, the bondholder is definitely promised at some specified time the payment of interest and principal. Furthermore, the bondholder is guaranteed, in so far as this can be done by a promise, only a specified minimum rate of interest while the stockholder is promised nothing. Subject to the action of the

board of directors, however, the stockholder is entitled to all of the residuary income and property of the corporation. The value of stock, therefore, depends mostly upon earnings, assets, and good management, rather than upon contractual features.

While the above statements are fundamentally correct, the modern tendency in finance is to blur these traditional types of investment issues. Even the promise to pay itself has been almost completely devitalized in the modern practice of issuing bonds whose maturity date extends 50, 100, or more years into the future. In this respect these bonds are to all intents and purposes in the same class as stocks. Preferred stocks are sometimes made redeemable at stated times at the option of the corporation. So, too, it is a widespread custom since the World War to make bonds callable at a certain price which is usually above par. This practice has been copied from real-estate financing, where the borrower has long been privileged to repay a part or all of the loan upon stated interest dates. One cannot but be impressed with the degree to which these modern practices have all but obliterated the distinction between stocks and bonds.

Risk, Income, and Control.—Analysis of the investment contract can best be approached by separating the detailed provisions into two broad groups: first come the specific things which the issuing body undertakes to do, second, the specific clauses or provisions in the agreement which are designed for the enforcement of the main covenants. The first group of provisions falls under three heads: (a) those relating to the income which the security holder may expect, (b) those having to do with the payment of the principal and income, and (c) those that define the relation of the security holder to the organization with reference to his degree of control or participation in its affairs.

Fixed Income.—A number of important questions arise respecting the income to be derived from bonds. These relate to the amount of income, its certainty and frequency, and the manner of receiving the same. The most common provision is that which specifies a definite amount at specified times. It specifies a definite annual percentage of the face value of a bond. It is generally payable semi-annually, although sometimes annually, or quarterly. Income is payable by either the coupon or registered method. In the former, which is rapidly becoming the prevalent type, interest notes, that is coupons, are attached to the bond. They are clipped when due and cashed at the local bank. Registered income is payable by check from the office of the maker or fiscal agent and mailed to the owner as determined by the names appearing on the records at the time.

The specific rate of interest borne by the bond depends chiefly on two factors: the quality of the bond itself, or risk factor, and the condition of the capital market at the time the bond is floated. It has become a

canon of finance that new bond issues must be sold close to par value. This is the starting point in determining the rate of interest specified in the bond. In practice, the issue price of the best bonds is usually several per cent below par, but weaker bonds are likely to be offered at 5 to 10 per cent discount. The discount allowed is partly in anticipation of improvement in the price in the near future and partly an appeal to the cupidity of the investor who imagines he is receiving something for nothing. The rate the new bond will carry will then depend largely upon the interest obtainable on market bonds of similar class and risk.

Contingent Income.—Contingent-income bonds sometimes bear the name of "income," "adjustment," or "preference" bonds. They carry no designation which stamps them as contingent-income bonds. For instance, the two contingent-income bonds of the St. Louis and San Francisco Railroad are designated as "income" and "adjustment" bonds. Contingent-income bonds specify a definite rate of interest, the payment of which is dependent upon sufficient earnings during the preceding period of 6 months or a year to cover the interest charge. Further detailed provisions are sometimes found in income bonds, making it obligatory for the corporation to pay such percentage of the specified income as is earned within the preceding period, such percentage being graded even to the $\frac{1}{4}$ per cent. The difficulty with all contingent-income bonds is the ease with which corporation accounting may be manipulated so as to conform to the desires of the management. This is likely to give rise to a difference of opinion and result in undesirable legal complications. The interest on some contingent-income bonds is made cumulative. This provision makes the terms retroactive, thus compelling the corporation to settle all unpaid interest as soon as earned. The cumulative feature adds greatly to the value of income bonds.

A hybrid type of bond appears in the General Mortgage 5s of 1955 issued by the Denver and Rio Grande Western Railroad. The income on this bond was contingent upon earnings in the period from 1924 to 1929 but was made payable only at the discretion of the board of directors. Income was cumulative although there was considerable uncertainty as to the interpretation of the language in this particular issue which rendered the cumulative feature of doubtful value. Beginning February 1, 1929, the interest on this bond became obligatory at the specified rate. No interest was paid on this bond during the period of contingent income, although the earnings for the period were ample to pay the full amount. The board of directors exercised its discretionary power and appropriated the earnings toward improvement of the property.

The other class of contingent-income securities is preferred stocks. The dividends on preferred stocks are stated as to amount but the payment is contingent not upon earnings but upon the action of the board of directors. The dividends in this case are merely preferred in relation to

dividends upon the common stock. Usually preferred dividends are paid when earnings are sufficient but this is by no means universal. Frequently the company needs its cash funds for business purposes, in which cases earnings may be retained by the company. If the dividends are cumulative, they are more likely to be paid at regular intervals, since accumulations will stand in the way of the common stockholders receiving distributions on their shares.

Participating Income.—As a special inducement for the purchase of certain issues, which are generally either debenture bonds or preferred stocks, recently participating features have been added. They offer additional income contingent however upon sufficient earnings and upon unusual distributions of earnings to the junior issues. For example, the 7 per cent preferred stocks of the Westinghouse Electric and Manufacturing Company and the Chicago, Milwaukee and St. Paul Railroad Company carry the privilege of participating equally with the common in all distributions of earnings after the common has received 7 per cent. Sometimes the participating feature extends only to a certain percentage, after which further distributions are entirely in favor of the common stock. The participating feature of the preferred stock of the Chicago and Northwestern Railway Company is interesting in this connection. After the common stock receives 7 per cent, the preferred is entitled to 3 per cent additional before any further distribution on the common can be made. Should the common also receive an additional 3 per cent in any one year, bringing the total distribution on each class of stock to 10 per cent, any further dividends must be made equally between the two issues.

Participation by class is quite common. This feature provides for participation on the basis of division of additional distributions in lump sum according to a stated percentage by classes of stocks. The amount going to each share of stock will then depend upon the amount of the stock outstanding. Obviously, the smaller the amount of stock outstanding, the closer will the distribution equal that made on each share of the common stock.

While theoretically attractive, the participating feature in practice has seldom proved of advantage to the stockholder. It is found mainly in weak issues and sold during prosperous times when conservatively inclined investors desire a greater share in the profits of industry but, nevertheless, are unwilling to sacrifice the preference which preferred stocks or bonds give over the common stock. These features generally lose all attraction in the first period of depression which follows, the investor finding that he has paid a fictitious price for his investment.

Dividends on Common Stock —The common stockholder in a successful corporation always benefits more than any other class of owners. On the other hand, nothing is quite so hopeless as his position in an unsuccessful

ful concern. For him who possesses the insight and judgment necessary in discriminating between the good and the bad, common stocks in American corporations offer the best opportunity for large income. Few American men of wealth arrived at their position except through the ownership of common stocks. Successful corporations rarely distribute more than 60 per cent of their earnings year in and year out, while most of them distribute a far smaller proportion. The balance is allowed to accumulate in a surplus account which may later be distributed in the form of stock dividends. Common stock has no stipulated rate of dividend, but when a certain rate has been paid for a number of years, a conservative board of directors will hesitate before reducing it, for this will reflect upon the general credit of the company. In case earnings are sufficient, the rate may gradually be increased or maintained at its customary figure, while a stock dividend is declared which in effect results in a larger distribution to the shareholders. Corporations frequently distribute extra dividends in addition to the regular rate. This is done when the earnings are temporarily large, and the board of directors desires to reward the stockholders accordingly. The extra dividend, however, should in no case be regarded as part of the regular rate, for when it is later dropped, as it in all probability will be, disappointment will come to the stockholder.

Control—The questions of control and management come up in the case of corporate securities. Control is either actual or contingent. Normally the bondholder's active relation to the corporation as a going concern is limited to the receipt of payments of interest and principal of the loan. Control by the bondholders is contingent upon the non-performance of certain covenants in the agreement, whereupon full possession of the property may be assumed.

One of the chief legal distinctions between bonds and stocks lies in the degree of control exercised in the management of the corporation. Stockholders are in legal theory the proprietors of the business; they stand as the successors to the partners in a partnership. Their method of control, however, in the modern business corporation is indirect, namely, through the election of a board of directors.

Apportioning the Risk.—The most significant part of the investment contract relates to the apportionment of risk among the various classes of security holders. The fact that risks are inevitable in the economic realm has led to financial expedients that look toward the division of these risks so as to meet the desires of all classes of investors. Many investors are ultraconservative and demand the Simon-pure interest that accompanies the riskless investment, others are willing to assume some little risk for a compensation; while still others consciously assume the greatest risks which financial instruments provide with the hope of obtaining profits. In order to satisfy these different demands, the science of

finance has invented legal arrangements which apportion the risk to the various classes of securities. These risks are roughly in proportion to the prospective income.

It is important to realize that risk is inherent in industry and that financial instruments merely segregate the greater portion of this risk in certain classes of issues. Even the most carefully planned investments occasionally bring nothing but disappointment. No matter what the legal arrangement may be, the ultimate satisfaction of claims depends upon the economic values lying back of the contract. The best that legal contracts can do is to create a *priority* of interest for certain security holders over others. This generally means that the securities of prime claim have current values back of them several times the amount represented by the security. The corporation that gives a first mortgage pledges the entire property and earning power to the payment of interest and principal of the mortgage obligation. It means, moreover, that issues of junior claim sacrifice their priority of claim upon property and earnings in favor of securities of senior lien. The creation of priority of claim upon earnings and assets is the key to the determination of the legal position of the various classes of securities.

Bonds are generally designated by descriptive terms which emphasize only one aspect, or a few aspects, of the obligation but often tell us little about the fundamental security. This is particularly true of debenture bonds which carry certain protective provisions not at all suggested by their titles. The same may be said in regard to preferred and common stocks. So intricate and complex have legal provisions become that the only safe procedure is to examine the detailed provisions of each issue. It is, therefore, the purpose of what immediately follows to discuss legal provisions having to do with priority of claim rather than conventional names. These provisions are found in practice in any and all sorts of combinations which taken together establish the legal position of a given issue.

Corporation Mortgages.—In the case of individual mortgages, the law has long permitted the mortgagor to execute the mortgage to a third party, known as the trustee, instead of to the mortgagee. This opened the way for the issue of corporation bonds owned by numerous individuals and interests, secured by a single mortgage which when executed to a trustee remains with him as long as the issue is outstanding. The corporation mortgage is usually referred to as a "deed of trust," but it differs in no essential manner from the individual mortgage which in many states is known by the same name.

The deed of trust, as in the case of the individual mortgage, is not an absolute transfer of title to the trustee but only a transfer in the interest of the mortgagee who still retains the privilege of foreclosure either through his own initiative or that of the trustee. The nature of the

corporate mortgage is succinctly stated by William Lilly in his *Individual and Corporation Mortgages*¹ as follows

The corporate mortgage is usually a deed of trust executed to a trustee who holds the legal title to the property as security for the repayment of the indebtedness which is generally evidenced by one or more bonds, or one or more promissory notes. Bonds are instruments under seal, and the notes are less formal promises to pay. In some states under trust deeds the mortgagor retains the legal title, and the trustee takes only an interest in the nature of security for the debt, for the benefit of the mortgagee. But in others, the trustee takes the legal title, while the mortgagor retains the equitable title, or equity of redemption, and the right of possession, unless it is agreed by the parties that the mortgagee shall have possession of the mortgaged property. The bonds or notes secured by a corporate mortgage usually find their way into the hands of numerous parties, and the corporate mortgage generally provides that it shall stand as security for the equal benefit of all the holders of the bonds or notes.

The power of a corporation to borrow money is well settled in law. The courts reasoned that the privilege of doing business which was granted to every corporation organized for that purpose involved the purchase of property on credit if so desired. If property could be purchased on credit, it was further stated that the corporation also possessed the power of borrowing money for any legal purpose whatsoever. It is furthermore well settled that the power to borrow money carries with it the power to give security for the loan. Thus the right to borrow money and execute mortgages by corporations are two powers implied in the privilege granted for the conduct of business. The by-laws of a corporation usually provide that corporate property can be mortgaged only by the board of directors with the consent of either two-thirds or three-fourths majority of the stock interests given at a meeting of the stockholders called for that purpose.✓

A bond issued upon the basis of the mortgage as security constitutes the essential legal evidence of the debt, the mortgage being looked upon as having no separate existence but being in the position of a supporting document. Any conflict in the terms contained in the bond with those found in the mortgage are usually reconciled in favor of the bond. Formerly, the holder of a mortgage debt possessed powers at suit of law not granted under foreclosure, but at the present time this distinction has been eradicated and foreclosure proceedings constitute the only steps necessary in order to enforce the debtor's claims.

The Trustee.—There is but one mortgage instrument underlying each bond issue and this is held by the trustee appointed by the corporation. It would be impracticable to issue a separate mortgage for each bond outstanding. Corporate property cannot be divided up in this fashion and nothing could be gained as long as the mortgage provides for the

¹ See p. 47

equal security of all bondholders under the single instrument. The trustee stands as the legal representative of the bondholders, and action against the corporation in the interest of the bondholders devolves in the first instance upon him. The trustee is accountable only in case of neglect of duty, which is interpreted to mean that he shall exercise a reasonable amount of diligence in the performance of his obligations. In case of neglect of duty, the trustee may be removed by order of the court.

The chief rights, duties, and obligations of the mortgage trustee have been summarized as follows ¹

- 1 To certify the bonds issued upon the mortgage under his trusteeship,
- 2 To see that interest charges and principal are paid when due,
- 3 To keep a check upon the physical condition of the property,
- 4 To see that the funds belonging to the mortgage holders are not dissipated,
- 5 To seize the property of the corporation under authority of the court when either principal or interest is not paid, provided this power exists, whether by statute, or provision in the mortgage where such is allowable by law,
- 6 To bring foreclosure proceeding and to request the court to appoint a receiver, if either interest or principal is not paid,
- 7 To sell the property in case of foreclosure, without operating it, if the mortgage expressly so provides

The corporate mortgage may create a lien on various kinds of property. Many different pieces of real estate located in widely different parts of the country may be included in the same mortgage. This makes the recording of the mortgage necessary in every jurisdiction where the property is located. Almost any kind of personalty may also be included in the same instrument along with real estate. Frequently liens, leases, leasehold rights, easements, franchises, and other privileges creating an interest in land, patents, stocks, bonds, and so forth, are thus included. While personalty may be mortgaged separately under a chattel mortgage, and stocks and bonds and other choses in action pledged under a collateral trust bond, the modern indenture is a single composite instrument including all of them. In fact, the appurtenant chattels of a railroad are treated as real estate for mortgage purposes.

Tax Covenant.—Since the passage of the federal income-tax law, most mortgages contain what is usually referred to as the "tax covenant." This provides that the company shall pay to the bondholders the amount designated "without deduction for any tax or taxes which the company may be required or permitted to pay thereon, or to retain therefrom, under any present or future law of the United States of America, or of any state, county, or municipality or other taxing authority thereon."

¹ W. E. LAGERQUIST, *Investment Analysis*, pp. 121-122. Chapter VII of this work gives a good summary of the mortgage.

This covenant may prove of great benefit to the investor and is being demanded more and more in new bond issues

Registered versus Coupon Bonds.—Bonds may be registered as to both principal and interest or only as to principal. When the bonds are registered, the corporation is legally liable for the principal and interest only to the owner whose name appears on the books of the corporation. Transfer may be made by having the new owner's name entered on the books. Sometimes a new bond is issued in exchange for the old one, sometimes the old bond is merely assigned to the new owner whose name is then registered on the books and delivered to him. If registered bonds are lost, the owner should immediately notify the corporation so that no fraudulent transfers will be made. Interest, however, will continue to be paid to the owner of a registered bond which has been lost or destroyed. Coupon bonds which do not have their principal registered may be transferred simply by delivery. Where the interest coupons are not registered, coupons payable to bearer may be presented by anyone, and they will be honored. The holder of a detached coupon has a contract independent of the indenture and becomes a general creditor of the corporation. While the bond itself must be properly signed by the officers of the corporation, the indenture generally provides that this may be authenticated by an engraved facsimile signature of the treasurer. In order to be genuine the indenture usually provides that the trustee authenticate the bond itself by his signature, he thereby becomes responsible under penalty for the genuineness of the bond.

Default.—Although the mortgage agreement contains many covenants relative to the preservation of the property mortgaged, thus far there has been developed no adequate means of enforcing most of these covenants. Strict legal theory might permit the trustee to take charge of the property or business in case of failure to perform any of the covenants. But such a course of action would only make matters worse by causing extra expenses and expanding the duties of the trustee beyond their present actual status. The keeping of most of the covenants in practice depends upon the good faith of the corporation and the esteem in which it holds its credit. It is becoming the practice to include in a separate section of the deed of trust the covenants, the non-performance of which is to be considered default. These invariably include the covenant to pay all interest and principal of the debt when due, although a period of grace of 30 to 90 days is usually allowed. The maintenance of adequate repairs on equipment of certain companies is also a common inclusion.

Beyond these, however, it depends upon the bargain struck between the parties concerned. Here, as in many other respects, the investor feels the need of a standardized deed of trust so that all uncertainty concerning the effective provisions may be removed. Likewise, the precise duties of the trustee differ in the different states. Aside from the

legal provisions that may exist in regard to the duties of the trustee in general, it is becoming the practice carefully to define his duties in the mortgage agreement

In case of the failure of a corporation to abide by the essential provisions of the mortgage, the trustee with the consent usually of a majority of the bondholders may assume control of the affairs of the corporation after the lapse of an interval of time. This does not deprive the bondholders of the right in case of necessity to take foreclosure action in the regular manner. If the trustee assumes control, he may sell the property of the corporation or operate it in the interest of the bondholders. In certain cases where it appears upon subsequent development that the exercise of this right is injudicious, it may be waived by the trustee. Other provisions permit the mortgagor by satisfying the bondholders to recover possession of the property even after proceedings have been instituted. The usual course of the trustee is neither to sell nor to operate the property but to apply to the court for foreclosure action, whereupon, if the petition is granted, a receiver is appointed by the court. The mortgage may provide that foreclosure may be started only after securing the approval of a specified number of bondholders. In the absence of any such specification and also upon the refusal of the trustee to take action, the courts allow a minority of the bondholders to request the trustee or, failing this, the court to institute foreclosure proceedings. This protects the minority against the inactivity of the majority.

Property once in the hands of the receiver may be sold to satisfy the claims of the creditors as determined by the combined action of the bondholders' committee in consultation with the court. If sold, it must be sold so as to conserve the best interests of all concerned, which would prevent dismemberment of the property into parts which would be inimical to its value. Property unconnected with the operation of the business, however, may be separately sold. The creditors or stockholders themselves may bid in the property in part or in its entirety and organize a new company or continue the old, depending upon the circumstances in each case.

Open and Closed Mortgages.—Corporate mortgages are designated as open-end, closed-end, or merely open. Closed-end mortgages are those whose amount is limited at the time the mortgage is written, and no further issue of bonds is possible upon them as security. They are the oldest type of mortgage bonds, and while their use is rapidly passing out of existence, some of the bonds based on this type of mortgage are among the strongest of corporation bonds. In the case of the open-end mortgage, all bond issues based upon the mortgage in question are limited to a specified amount but may be issued in instalments. All bonds issued in this way upon the same instrument have equal claims upon the property covered in the mortgage.

Open mortgages permit, according to the provisions contained in them, the unlimited issue of additional bonds upon the same mortgage as security. The additional amount issued, however, is limited to a certain portion, say, 75 per cent, of the value of the extension or addition of property coming within the lien of the mortgage. Thus by the addition of new property, the strength of the security, even of the old outstanding issues, may be improved. On the other hand, if no new property is acquired and at the same time additional bond issues are floated upon the basis of existing property, the issues would be weakened. Open mortgages may be vitally affected according to the principles of valuation of property used, the state of the currency, and business conditions. Bonds issued upon high valuations are correspondingly weak because of the danger of future shrinkage. Bonds issued upon the basis of valuations in boom periods or periods of inflations such as war periods are especially subject to weakness. The open mortgage cannot be regarded with the same degree of satisfaction as the other types mentioned. Some protection is afforded the investor in case state laws limit the issue of bonds. The common provisions in this connection stipulate a certain percentage relationship between bonds on the one hand and fixed property or capital stock on the other. But where no limitation upon the capital stock is provided, it is plain that no definite proportion between bonds and capital stock would afford the security sought by the investor.

Blanket and Specific Mortgages.—Blanket mortgages cover all the property of the company and are quite generally found among industrial and sometimes public-utility corporations. All of the property in the possession of the corporation at the time of the execution of the mortgage is pledged for the security of the bonds. A blanket mortgage may be strengthened by the insertion of an "after-acquired property clause" which provides that "all property now owned or hereafter to be acquired" is pledged for the security of the bonds. This normally increases the equity behind the bonds. The legal device of purchase-money mortgages which permits newly acquired property to be mortgaged for a separate bond issue may, however, defeat entirely the original purpose of the after-acquired property clause. Specific mortgages have as their sole security the property mentioned in the instrument. *J*

Junior Mortgages.—Second, third, and other junior mortgages covering certain property are, of course, always subject to all the prior claims such as first mortgages, receivers' certificates, and taxes. As far as the individual corporation is concerned, bond issues rank in order of the mortgage lien. Caution, however, should here be given that there is nothing in the mere name of first, second, or third mortgage with reference to the ranking of securities of different corporations. Some second-mortgage bonds issued by strong companies, for reasons later to be explained, may be superior to first-mortgage bonds issued by weaker

companies Except in a few outstanding cases, names of securities here as elsewhere are of lessening significance in modern investment.

Reorganization.—Although contracts are usually considered inviolate, there are circumstances under which they must give place to new and substitute agreements. This is best illustrated in the case of railroad finance, which is by far the most complex of all corporation finance The development of railroad systems of the present day came about by longitudinal and lateral consolidations of scores of small and connecting lines When consolidation took place, the integral units of the new system had outstanding contracts on mortgage loans which could not be settled until the maturity of the bonds In this way it came about that the large systems had many underlying small issues which were a first claim on the company As the systems grew, new lines were built and financed by the parent company, and the older and smaller bond issues gradually matured and were paid off This situation gave the railroads the opportunity of issuing general, consolidated, or refunding bonds which were a first mortgage on unencumbered property and were made to include the property which was uncovered by lifting previous mortgages Many of these small issues, however, were not canceled until the system went through the pains of reorganization or receivership At such times, with the consent of every bondholder, scores of these small issues were consolidated into one of the larger issues, thereby simplifying the entire finances of the railroad

The protection of the legal rights of the different classes of security holders in reorganization makes necessary the consideration of the fundamental economic position of the properties New securities are exchanged for old on the basis of relative values and not according to legal rights The economic importance of the property behind the bonds is usually judged mainly upon the basis of the independent earning power and the strategic position it holds with respect to the entire system of which it is a part Judged upon this basis, railroad bonds are found to fall into three main classes those underlying or divisional mortgages whose security rests on property of the main line which is indispensable to the system, those representing later mortgages upon the main line divisions and branch lines which have an independent value of their own, and, lastly, those, although first mortgages, that rest upon property not in itself possessing large or independent earning capacity. The bonds of the first class are usually in an impregnable position and often are allowed to remain undisturbed but are frequently exchanged upon a favorable basis for securities of new and larger issues These bonds seldom suffer in reorganization. The second class, however, are not in such a strong position, and their holders may be required by the court to accept considerable sacrifices. The last class of bondholders is in an extremely

weak position, being called upon frequently to make substantial sacrifices. The court may even extinguish most of the claims of this class.

In the final analysis, corporation mortgages given to secure bonds or notes are not what they seem to be. Especially in connection with property devoted to the public service, the courts have developed the theory of the priority of the rights of the public to the service of the corporation. Speaking of corporations in general, Dewing, in his work on *The Financial Policy of Corporations*, says, "The modern practice of the courts in appointing receivers at the first intimation of financial difficulties, tends to defeat both the letter and the spirit of the mortgage bond."¹

Collateral Trust Bonds—Collateral trust bonds are bonds issued on the basis of intangibles, such as stocks and bonds, as collateral security. They are accompanied by an indenture which does not differ in its essential respects from the mortgage indenture and which is in the custody of a trustee while the bonds are outstanding. This instrument gives a lien upon the deposited collateral which, in case of default of any of the specified covenants, becomes subject to foreclosure and sale the same as the property back of the mortgage indenture.

Collateral trust bonds are issued by practically all kinds of corporations. Dr. Dewing's² analysis shows three reasons why such bonds have come into general use. First, a corporation may possess some or all of the bonds of a number of small issues all of which have no established market of their own. By pledging these bonds as security for a single large issue, a market for them can easily be established, especially if the corporation is well known and has good credit. Second, collateral trust bonds may be issued by parent corporations created partly at least to circumvent legal restrictions in issuing securities such as the after-acquired property clause in certain mortgages of subsidiary corporations. The third reason is in order to avoid direct liability for damages. A large corporation having various properties, each of which entails an independent risk of suit for damages, may escape liability entirely by creating subsidiary corporations whose property is bonded to its full value. The bonds of several of these smaller companies may be held by the parent company and deposited for security of a collateral trust issue, while at the same time they cover the entire equity of the subsidiary corporations, precluding the recovery of damages in a legal suit.

The ultimate value of collateral trust bonds depends upon the character of the securities deposited with the trustee. Collateral trust bonds may be securities of first rank if they conform to the following conditions.

1 The collateral itself must be of first rank. It may consist of bonds of independent companies or of bonds of subsidiary companies having a direct business relationship with the parent company, but capable of being independently operated.

¹ Vol I, p 42

² *Financial Policy of Corporations*, pp 128-131

2 The value of the collateral must show a good margin above the principal of the collateral trust bond and the interest on the collateral issue must be sufficient, with a liberal margin, to cover interest requirements on the collateral trust bonds

3 The collateral trust bond is greatly strengthened and specially desirable if the collateral is well diversified so that it may be marketed without materially affecting its price

The weakest of all collateral trust bonds are those that are secured by the pledge of stock of subsidiary companies. Aside from their contractual features, these are not bonds at all, and the investor must constantly be on the lookout for this type of issue. The collateral trust bonds of public-utility holding companies interested in the gas and electric business and, also, of telephone and telegraph companies may be issues of high merit. This would be the case where the subsidiaries are widely scattered and many issues are pledged as security for the collateral issue. It becomes highly important to have a clause in the trust agreement forbidding the issue of additional bonds or stocks by the subsidiary companies of equal or prior lien with those deposited as security, unless a proportion thereof, sufficient to protect the interests of the collateral trust bondholders, be deposited as security.

Equipment Obligations—Until recent years, equipment obligations were used almost exclusively in railroad finance to provide new equipment where the railroad had difficulty in raising funds through the ordinary means. Within the past few years, however, equipment obligations have appeared in connection with ocean and lake transportation companies and certain manufacturing concerns.

Equipment obligations may be issued on the basis of the lease which is known as the Philadelphia plan or under a mortgage lien sometimes called the New York plan. Under the Philadelphia plan the railroad company desiring to acquire new equipment advances an initial payment. It then secures the use of the equipment under lease but acquires no title until the instalments are completely paid. This plan was the outcome of the fact that the Pennsylvania courts would not allow moving equipment bought on the instalment plan or on conditional sale to be used as a basis of a loan from a third party. Under contract with the manufacturing company, the railroad company pays one-tenth or more as initial payment, whereupon the cars and locomotives are constructed according to specifications. The trustee then acquires full title and issues trust certificates through which money is secured to pay the manufacturing company in full for the equipment. The lease then provides that the railroad company shall pay annually to the trustee an amount which will cover the interest requirements on the entire issue and, also, sufficient funds to meet the portion of the obligations that mature during the year, the certificates having been issued on the series plan. When the period necessary to complete all of the payments, usually 10 years, has elapsed,

the trustee executes a bill of sale in favor of the railroad company. During the term of lease the railroad company promises to keep the equipment duly repaired and insured, to replace cars destroyed for one reason or another, and to assemble the equipment at a designated point for delivery to the trustee in case it fails to keep any of the covenants.

Under the New York plan the railroad acquires the equipment directly from the manufacturing company or receives it through a conditional sale from the trustee. A mortgage is then placed upon the equipment, which is the basis of a bond issue which becomes a direct obligation of the railroad company itself. This plan is inferior to the Philadelphia plan from the contractual point of view because the title to the property is not so clear as in the former case.

Equipment obligations are usually based upon both cars and locomotives. The period of payment by the railroad company usually runs for 10 years, while the equipment itself has a life several years longer or in some cases four times the period of the last series of the obligation. This creates an ever-increasing equity back of the lessening amount of the obligations outstanding and has contributed to the strong position of the equipment obligations among investors. For this reason and since a railroad cannot operate without equipment, equipment obligations are perhaps the strongest type of railroad security. They have been known to take precedence in claims on roads in receivership over first and underlying mortgage bonds. The yield of these issues is usually something like one-half of 1 per cent less than the best mortgage bonds show.

Debenture Bonds—Debenture bonds are bonds without a specific lien on property. They are sometimes called general credit bonds. It was the custom before 1900 to issue debenture bonds which contained all of the provisions of the contract in each bond. Since that time, however, it has become the universal practice in issuing debenture bonds to execute an indenture the same as in the case of mortgage and collateral trust bonds. The indenture is to all intents and purposes the identical legal instrument as in the case of mortgage bonds, with the exception that no property is pledged and, therefore, no foreclosure suit can be instituted. Debenture agreements, like mortgage agreements, are far from being standardized and the covenants contained therein are the result of bargaining between the parties concerned. The typical debenture agreement contains a clause providing for the immediate maturity of the principal of the loan in case of default on the interest payment. It also provides that the debenture bond shall be secured equally with any future obligation issued by the company. Various other provisions also occur, such as the maintenance of a definite ratio between current assets and current liabilities, the current ratio, sinking-fund provisions, and conversion privileges in case of convertible bonds.

Unsecured bonds and notes rest upon the general credit of the maker and lack one of the strongest features of a desirable contract. The maker of an unsecured obligation may at the time have ample property. It is unsafe to depend upon this, however, since the property may be disposed of or a mortgage placed upon it which then becomes a prior lien. Furthermore, the holder of the unsecured obligation does not possess the right of foreclosure but may be compelled to resort to civil action to make good his claims, often an inconvenient and expensive process. Default upon either the interest or principal will result in failure and receivership, a condition not different from that resulting in default on mortgage bonds.

Debenture obligations are inherently weak, however, in several respects. They constitute at the time of issue a junior claim upon the assets of the corporation. They are thus treated almost universally by receivers' courts. Furthermore, the general credit of corporations or governments issuing debentures is subject to change. Corporations may subsequently issue mortgage bonds which deprive the debentures of the asset security which was formerly theirs. This may be avoided by the very common practice of including in the agreement a clause forbidding any subsequent prior-lien issues during the time the issue is outstanding. The strength of debentures may also be undermined by the subsequent issue of more debentures of equal claim. A provision is now usually inserted in the agreement forbidding this practice. With proper protective clauses, debenture bonds may be very strong issues even from the point of view of the contract element.

Assumed Bonds.—The case of assumed bonds seems at first sight complex but in reality is very simple. Assumed bonds arise at the time of consolidation, reorganization, or receivership. Small corporations are often merged or consolidated with larger ones. The bonds of these small corporations are often left outstanding, but the provisions of their contract are assumed by the succeeding corporation. These bonds are thus undisturbed as far as the agreement with the bondholders is concerned. The investor stands precisely in the same position as before, except for the change in one party to the contract. As a general rule, assumed bonds are first-mortgage bonds and have on this account acquired an enviable reputation. At the time of receivership, they are treated as bonds originally issued by the corporation in receivership.

Guaranteed Bonds.—Guaranteed bonds are quite similar to assumed bonds. They arise, however, in a different way, the most common case being where a large corporation leases the property of a smaller corporation and guarantees either principal or interest, or most commonly both, of the outstanding bonds. In effect this is simply the endorsement of the promise of the smaller corporation by the larger one and may not greatly improve the contract. Receivers' courts all but ignore such guarantees.

and they may even be repudiated by the guaranteeing corporation regardless of its success or failure

Joint Bonds.—Perhaps still more confusing is the case of joint bonds. They usually arise where several railroad or other transportation companies desire to use certain property jointly, such as terminals, bridges, and docks. A small corporation is created for the ownership of the joint property the stock of which is all held by the parent corporations. Bonds are then issued, usually in relatively large amounts, by the small corporation and guaranteed jointly by the railroad or other transportation companies. The bonds themselves may be first-mortgage, general-mortgage, collateral trust, or equipment bonds. From the contractual point of view, these bonds must be judged on the basis of their separate provisions. The fact that they are jointly guaranteed strengthens them only by virtue of the fact that there are several endorsers instead of only one and consequently they are only a special case of guaranteed bonds. Receivers' courts treat them as other guaranteed bonds.

Receivers' Certificates.—These are in effect short-term notes unsecured by the pledge of property and issued under the direction of the court by the receiver in charge of the financial affairs of a corporation in order to secure immediate cash. Receivers' certificates are commonly found in connection with public-service corporations, and their purpose is to supply cash necessary for continued operation of the utility and for permanent improvements. They are, nevertheless, sometimes issued in case of manufacturing companies.

The exact status of the promise to pay in this case depends somewhat upon the attitude of the individual court concerned. It is quite generally the case, however, that these certificates constitute a lien prior even to first-mortgage liens—taxes, expenses of receivership, current charges for wages and supplies and mechanical liens only having priority over them. It is absolutely necessary to give such obligations a prior claim, for the credit of the corporation is usually entirely ruined on the basis of the existing financial structure. Before the corporation passes to its new owners, receivers' certificates are usually either paid in cash or satisfactory adjustment is made through their exchange for bonds. At any rate, settlement must be made before the property of the failed corporation is turned back to its owners.

The final investment strength of receivers' certificates depends upon the corporation. Although issued by order of the court, in no case are they to be considered public obligations subject to liquidation through taxes. In case the corporation is absolutely essential to the public welfare and the payment of receivers' certificates in cash is an impossibility, their owners may be compelled to accept whatever other securities of the corporation the court sees fit to offer them. This arbitrary power of the court throws a veil of uncertainty about receivers' certificates, and

the final word cannot be said except after the court has been heard. The good faith of the judge can ordinarily be depended upon, however, to make satisfactory settlement with the owners of receivers' certificates.

Sinking Funds.—A sinking fund may be defined as a fund provided for the redemption of a part or all of an issue of securities at or before maturity. Before 1910, sinking funds were used almost exclusively in connection with bonds, but since that date they have also been of general application to industrial preferred stocks. The variety and details of sinking-fund provisions are almost infinite. The motives and purposes underlying these provisions, however, are comparatively few and simple and need consideration.

From the earliest times, it has been a part of the theory of American finance that both public and private debts should be paid. A definite means of accomplishing this was the sinking fund, which provided for regular and certain liquidation of the debt. The national government employed the principle early in its history by appropriating special revenues for the purpose. It succeeded in canceling the entire debt by 1835. The same principle was employed following the Civil War and has more recently been used in canceling a considerable amount of Liberty bonds and Victory notes. The principle has found wider application in connection with state debts, and its use in connection with municipal financing is almost universal. In their early history railroads imitated the public in their financial methods. They proceeded upon the theory that their debts, too, should be paid, and the result was that almost invariably railroad bonds were of short maturity and carried sinking-fund provisions. Gradually, however, railroad property came to be looked upon as permanent in character and with the receiverships following the panic of 1893, when about 25 per cent of the bonds of roads in receivership had sinking-fund provisions attached to them, the courts assumed the attitude that railway debts were also permanent in character. This led to the authorization and issue of bonds of 100 years and more maturity and a decreased use of the sinking fund. At the present time not over 15 per cent of the railroad bonds of the country carry sinking-fund provisions.

The second motive in the employment of sinking funds is the maintenance and increase in the equity back of security issues. This is accomplished by either the maintenance or increase of the actual property back of the issue or, if the funds are used for retiring part of the issue, by lessening the amount of the issue outstanding. Corporations have proceeded upon this principle in the past where circumstances rendered its use obligatory, in order to protect their credit and support the market for their securities. The provision for repayment through sinking funds has found its most extensive use with corporations whose assets for one reason or another tend to decrease. Such are the assets of mining, timber,

and oil concerns, especially the smaller ones, whose assets are constantly wasting away to the exhaustion point as operations proceed, likewise the assets of land companies tend to decrease with the disposal of their land. The sinking fund often takes the place of a depreciation fund as in the case of equipment obligations of railroads, street-car companies, tank-car concerns, ship companies, and so forth. Here the property gradually wears out and a fund must be provided out of earnings to cancel the debt before the physical assets become entirely valueless. Manufacturing concerns whose property is subject to rapid deterioration, either from use or out of sheer obsolescence, have extensively employed the sinking-fund idea. Almost 60 per cent of industrial bonds and, perhaps, over 90 per cent of preferred stocks are protected by sinking-fund provisions.

The third motive in the creation of sinking funds is especially intended to appeal to the investor. In recent years, the competition for funds has been so keen that public utilities have found it necessary to attach such a provision in order to raise the enormous funds required for the expansion of their business. Something like 50 per cent of all public-utility bonds has such a feature. They are generally of long maturity and the fund accumulated in the end will cover only a portion of the issue concerned. Like railroads, the property of public-utility concerns is of a permanent character, and the theory of sinking funds applicable in the case of decreasing assets finds no place here.

A fourth motive in sinking funds is found in short-term financing. In periods of stress following a period of excessive activity, corporations find that their inventories are abnormally large and slow of movement, while the financing was done largely through bank notes. Since maturing loans must be met, the corporation resorts to the issue of short-term bonds, notes, and preferred stocks to which is attached the sinking-fund provision. This motive has found large application since 1919 in industrial and mining concerns.

What is the value of the sinking-fund provision to the investor? Most authors have spoken strongly against it, regardless of the use made of the principle. In the case of government, state, and municipal bonds, administrators of the sinking fund have frequently found ways of defeating its purpose. The 1 per cent sinking fund for the federal debt established in 1868 has fallen into disuse but, if available, would now cancel almost all of the debt to which it was originally applied. The sinking funds of states have often been dissipated through mismanagement. In Pennsylvania, the sinking funds may by the constitution of the state be used in case of war, invasion, or insurrection. Cities, too, have attached such details to their sinking funds that their object has been defeated. Pursuant to the provision that the sinking fund might be used to purchase sound investments, the administrators of the fund in New York City

used it to purchase a new issue of bonds of the city, thereby defeating the very purpose of reduction of the debt

In the case of corporate business, if the property is adequately maintained, as in the case of railroads, so that its value at the maturity of the bonds is equal to or greater than it was at the time of issue, there can be little need for a sinking fund. In such cases, the credit of the corporation will in all probability be maintained, which will enable the corporation to float a refunding issue. On the other hand, where bonds and notes are issued on the general credit of the company, the sinking fund may serve a most useful purpose. Likewise, in temporary financing where notes and preferred stocks cover abnormally large current assets, a fund to redeem the issues when the assets are liquidated will have a wholesome effect upon the management.

Sinking-fund provisions proved to be failures in the case of railroads during receivership in the nineties. This might have been expected, since payments from earnings into the fund would have rendered the payment of bond interest impossible. Rather than insist upon the payment into the sinking fund, the trustees of the mortgages chose to apply the funds to the payment of interest and thus attempted for awhile at least to ward off failure. The chief use of the sinking fund, then, is to conserve the funds of the corporation while earnings are available and thus avoid the excessive payment of dividends or undue expansion. To accomplish this purpose, the best method of employing the sinking fund is to purchase and cancel bonds of the issue to which it is applicable. When the sinking fund is invested in the plant, however, it is a misnomer. A fund used to expand business is no sinking fund at all. A sinking fund should properly be a cash fund available for the payment of obligations at or before maturity. If the fund is invested in a fixed plant, it is not available for cancellation of the issue. Furthermore, it is not at all certain that, when the issue matures, the condition of the investment market will admit of economical refunding of the issue. Even if it did, such a course would surrender the entire theory of the sinking fund by perpetuating the outstanding obligations of the corporation.

Serial Issues—Closely akin to the sinking-fund method of retiring obligations is the serial method of issuing bonds and other obligations. This provides for the maturity of a certain amount of an issue at regular intervals, usually each year beginning at a specified time. This method of reducing obligations has been used extensively in equipment obligations, timber bonds, and municipal issues. It is preferable to the sinking fund, its operation is more certain, since the failure to meet a serial issue at maturity would be counted as a default, which in the case of municipal and private corporations would lead to legal action against the offenders. It avoids the uncertainty in the handling of funds, since they remain in the possession of the maker only a short time until they are expended.

in the satisfaction of the maturing portion of the debt. In all cases above discussed where the sinking fund is found in practice to be valuable, the serial provision is probably superior. It is sometimes forgotten that maturing obligations have to be met with cash. If money appropriated to the sinking fund is accumulated and invested in improvements or in the securities of other corporations or governments, there is no assurance whatever that the funds will be available when needed. Serial bonds with annual maturities make it unlikely that cash will not be available when needed, since the payments must be met regularly.

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CHAPTER XII

THE CONTRACTUAL ELEMENT OF CREDIT: STOCKS

The stockholders of corporations represent the proprietary interests and as such have certain rights and duties which distinguish them from the creditors. Yet the stockholders are not the direct owners of the property of the corporation. The corporation itself has been erected to the status of an artificial person in legal theory and as such is the legal owner of all of the corporation's assets and rights. The stockholder is merely the owner of his proportionate share in the corporation as a distinct legal entity. Individually he has no control whatever over the property or affairs of the corporation. It is only through the corporate organization that he exercises his proprietary rights. These are carefully defined in the law which it is our purpose to present briefly.

The Board of Directors.—The board of directors is generally entrusted by law with the management of the business for which the corporation is chartered. Directors have the implied authority to bind the corporation by their acts if within their express or implied powers relating to the business of the corporation. They, instead of the stockholders, are thus the original and supreme authority in making corporate contracts. They have the power to borrow money and issue bonds and notes, to pledge or mortgage the property of the corporation, to assign and lease its property, and to pay dividends. But statutes and charters often require the assent of stockholders, or a certain percentage of them, for particular acts.

Their power does not ordinarily extend to making fundamental changes in organization, charter, or powers of the corporation, but only to carrying on of the ordinary business of the corporation. They have no power to alter the charter, to increase or reduce the capital stock, to consolidate with another corporation, to surrender the charter or wind up the affairs of the corporation, to sell the assets of the corporation if by so doing it interferes with the regular conduct of the business, or to make, alter, or repeal the by-laws, unless expressly granted the power.

Sometimes as a protection to stockholders the charters and general statutes require the assent of stockholders for certain acts of the board of directors. Such assent is frequently required for the issue of mortgages, increase in bonded indebtedness, transfer of land, and the like. The assent of one-half or two-thirds of the stockholders is usually specified.¹

¹ For the legal position of the board of directors, see W. H. Ballantine, *Private Corporations*, Chap. IX.

Unless provided for by statute or in the charter or by-laws of the corporation, the board of directors possesses the power of incurring indebtedness limited only by its own prudence. In every case whether the indebtedness be in the form of bonds, notes, bank loans, or otherwise, it becomes a prior claim on both the earnings and assets of the corporation ahead of the stockholders' claims. In view of the present tendency toward borrowing, this privilege of the board of directors is a dangerous weapon which should be employed only with great discretion. Neither preferred nor common stockholders are in a position effectually to check what might easily become, and in fact has become, an unwholesome practice.

Duties of Directors—Some of the principles relating to the duties of the board of directors are clear in law. Among them is the principle that directors, as well as officers of corporations, are liable to the corporation for losses resulting from fraudulent acts, or from acts exceeding their powers, or for negligence in management. But they are not liable for losses resulting from mere mistakes of law or fact, or from errors in judgment in management. Ordinary skill and care in management is all that is required.

Directors are in the position of trustees with reference to the corporation. Their position is not merely that of honor but requires that they exercise vigilance and be familiar with the by-laws and with the affairs of the company. They cannot remain silent in the presence of fraud known to them affecting the property of the corporation or otherwise. Ballantine says, "The only proper rule is that the directors are liable on the ground of negligence when, and only when, they have failed to exercise ordinary care and diligence, and ordinary care and diligence is such care and diligence as ordinarily careful and prudent men generally exercise under similar conditions and circumstances"¹. This is to be determined by the circumstances of each case instead of any set rule. Honest mistakes of judgment do not bind either the board of directors or the officers. Officers and directors must have actually participated in wrongful acts before they may be held liable.

Directors and officers are bound by restrictions contained in the charter and by-laws, and for acts in excess of these they are held liable for damages to the company. Owing to their fiduciary position, directors and officers cannot, either directly or indirectly, make secret profits out of the corporation, their duty being to guard the interests of the corporation. Directors cannot deal with corporations at arm's length like strangers but are bound by rules of fairness and good faith common to fiduciaries.

Stockholders' Participation in Management.—Stockholders' rights in the management of corporations must be exercised at legally con-

¹ BALLANTINE, *op cit*, p. 361.

statuted regular or special meetings. Moreover, then powers must be exercised collectively instead of individually. Mere majority action outside a legal meeting does not constitute legal action.

Every stockholder has the right to vote in the absence of some charter or statutory provision to the contrary. He may surrender his right by agreement if assented to by all of the stockholders. The charter or statutes may limit the number of votes of each stockholder, classify the stocks, and withhold the voting privilege from any class, or restrict the vote to persons having held the stock for a specified length of time. If there are no statutes to the contrary, the charter may exclude preferred stockholders from voting in consideration of their preferred position. But the owners of a small class of management stock must abide by all of the rules limiting others in a fiduciary position in the exercise of management powers. The management shareholders must consider the interests of other classes of stockholders when the latter represent substantial investments. It is a question whether adequate protection is given the investment in preferred and common stocks through concentration of control in the hands of management stock. Those who share the profits and losses would seem to be the proper ones to control the affairs of the business. Even preferred stockholders in their position as quasi-creditors would profit by this privilege. The statutes of Delaware provide that even bondholders may be given the right to vote.

By-laws may regulate the method of voting at meetings of stockholders, if passed upon by a majority of stock and if they are not unreasonable. They may also take away the voting right if consent is obtained. But the right to vote cannot be conferred upon bondholders through by-laws. Stockholders having a personal interest in contracts before the corporation have the right to vote in spite of their position. But a majority of stockholders cannot control the corporation in their own interests individually or against the rights of the minority. The tendency is, moreover, to regard the majority as being in a fiduciary position with the minority. Trustees or executors holding stock for beneficiaries have the voting right. Even if the stock stands in the name of the decedent, the trustee may exercise the vote in certain states. But a corporation having treasury stock cannot vote the stock. It must first be reissued. This rule applies also to unissued stock. A corporation holding stock in another corporation has the right to the vote the same as when held by a private individual, unless it can be shown that some ulterior motive exists.

Voting Rights—At common law each stockholder is entitled to but one vote. But statutes, charters, or by-laws may grant one vote to each share or make other arrangements affecting the exercise of the voting privilege. The normal situation is for each share to have one vote. Cumulative voting exists under the laws of some states, as in

Pennsylvania This power must be expressly granted in the charter, or statutes, or by-laws and sometimes is found in constitutions This allows votes to accumulate on single candidates for directors and thereby secures representation of the minority shareholders The right to vote by proxy does not exist at common law but must be granted by charter, by-laws, or statutes Proxies may be revoked at any time, even in meetings under progress Proxy rights are granted in most jurisdictions at the present time Irrevocable proxies are generally illegal

Contracts to vote stock are illegal if the agreement contemplates fraud upon stockholders or creditors But stockholders may agree among themselves for the elections of directors if not accompanied by bad faith or fraud upon the minority In fact, the control of corporations depends regularly upon some group securing the majority stock for voting purposes On the whole, directors and officers own only about one-tenth of the stock of corporations and it becomes necessary to secure proxies if legal elections are to result Control is ordinarily secured by one of several means, namely, by voting trusts, by holding companies, or by classification of stock with control in bankers' shares or in management stock

Voting trusts are used to combine voting power to secure control in order to insure continuity of management and policy Stocks are pooled in favor of trustees who issue trust certificates to replace surrendered stock which is then transferred on the books of the corporation to the names of the trustees Dividends are paid then to the beneficial owners of the stock This form is commonly sanctioned by the courts in the case of reorganized corporations to insure their future success If the voting trust results in management in the interest of others than the stockholders, it is void The voting trust is frowned upon in some jurisdictions because the permanent signing away of the voting right is held contrary to public policy Such pooling arrangements, therefore, are often held void because contrary to public policy. But this is the unusual view The better view seems to be that voting trusts are valid in the absence of some ulterior or fraudulent motive

Powers of Stockholders.—The majority stock has the control of corporations unless it can be shown that the act in question is not in good faith and in the interest of the corporation But they must not act fraudulently or in bad faith so as to jeopardize the interest of the minority. The minority then must always abide by the decisions of the majority Blackstone compared corporations to little republics in this respect.

Stockholders have the power to elect the board of directors, to increase or decrease the capital stock, to make by-laws, to transfer or lease all property of the corporation, and to liquidate its affairs, all of this provided the act is not contrary to the charter or by-laws Stockholders individually have no power to act in the name of the corporation Dis-

solution of the corporation may take place by action of a bare majority and the assets distributed to the stockholders if the business can no longer be carried on profitably. But if the latter contingency is not present, every stockholder has the right to insist that the business continue for the lifetime of the charter. Under these circumstances not even the majority can discontinue business.

In disposing of its property legally, the corporation may accept stock in another corporation, in exchange for which stock may then be distributed to its stockholders or sold for cash and the proceeds distributed. But all of the stockholders must consent; a majority is not sufficient. Dissenting stockholders may require that the stock thus acquired be sold for cash and the proceeds distributed to the shareholders. But the transfer of property of one corporation to another in exchange for its stock cannot be carried out by action of a majority if the purpose is merely to secure other control, unless the statutes of the state permit. Statutes frequently provide that corporations, with the consent of two-thirds of the stock, or other majority, may sell their property. These provisions permit consolidations of corporations under one management. But even so, courts hold that the majority stands in a fiduciary position and must not impose its will upon the minority against the latter's interest.

Rights of Stockholders—The most valuable right the stockholder possesses is to share in the profits of the corporation as he of necessity must share in the losses. Recent decisions seem to indicate that a corporation cannot go on indefinitely adding profits to capital and accumulating a surplus. But stockholders seem to have the right to have the profits periodically divided among them in proportion to their relative interests. In *Dodge v. Ford Motor Company* the court said "A business corporation is organized and carried on primarily for the profit of the stockholders—the discretion of the directors is to be exercised in the choice of means to attain that end, and does not extend to a change in the end itself, to the reduction of profits, or to the non-distribution of profits among stockholders, in order to devote them to other purposes"¹. Thus directors cannot avowedly sacrifice the interest of the stockholders.

The declaration of a dividend creates a debt in favor of the stockholders at the time of declaration. But until the dividend has been declared, the stockholders have no right to the earnings. Dividends cannot be declared out of capital except for liquidation purposes. Directors, nevertheless, are permitted to exercise discretion as to the needs of the corporation and its financial position before declaring dividends. But directors cannot unfairly and indefinitely refuse to distribute earnings to stockholders even though no question of fraud be present. Creditors in insolvency have a claim upon all of the assets of the corporation,

including the surplus earnings, ahead of the stockholders. But dividends once declared are debts and stockholders then have a claim upon the property the same as other debtors. They may even sue the corporation to compel payment.

Although dividends cannot be paid out of capital, nevertheless loss of capital in previous years need not be made good out of surplus before the dividends are declared. If current operations show a profit, dividends may be paid. Each year is regarded as a separate period. It seems that a current charge for depreciation is not always necessarily made before dividends may be legal. But in some states statutes limit the payment of dividends to profits after payment of taxes, operating expenses, and fixed charges. In other states surplus of assets over capital paid in is required. In the case of railroads or similar corporations, depreciated property must be made good and expenses for repairs and renewals met before dividends can be declared out of profits.¹ In the case of mining properties where assets are being constantly exhausted, no replacement of capital is necessary before estimating profits out of which dividends may be paid.

Dividends may generally be paid in cash, property, bonds, or stocks, if reserve stock exists. Cash dividends must be made in lawful currency. In some states stock dividends are unlawful. The board of directors may fix the time for payment of dividends, but if no time is set they are payable on demand. When shares are transferred, the transferee, or pledgee, is entitled to dividends subsequently declared. The corporation, however, must receive notice of transfer or it may continue to pay to the owners as they appear on their books.

Right to Inspect the Books.—Every stockholder at common law has the right to inspect the books and papers of the corporation, if he requests it at reasonable times and for legitimate purposes, and the officers must not withhold this right. This privilege is granted in order that the stockholder may know the affairs of his company or to protect his interests. But when this privilege is sought for interests inimical to the corporation, it may be refused. This right of inspection is in most states regulated by statutes which are generally more liberal than the common law. Stockholders may generally enforce this right by mandamus if necessary. The privilege of stockholders to inspect the books is a valuable provision against mismanagement, fraud, or manipulation of accounts. The practice in England of having a stockholders' audit could well be introduced into the United States.

Liability of Stockholders.—Stockholders have certain liabilities to the corporation and certain others to creditors of the corporation. These are fixed partly by constitutions and statutes and partly by charter. These liabilities are found in connection with unpaid subscriptions,

¹ BALLANTINE, *op cit*, p. 512

assessments, watered stock, no-par stock, and special liability to creditors. In this connection the word "call" is used to designate the resolution of the board of directors or demand by other authority for stockholders to make specified payments on unpaid subscriptions. When stock has been fully paid and additional demands are made upon stockholders, the term usually employed is "assessment."

Subscriptions not fully paid are subject to call in the future by the board of directors, unless dates are specified in the subscription agreement. Assessments are always ordered when the occasion arises. Generally when stock is transferred on the books of the corporation in the absence of fraud, the transferee is liable to future calls for the unpaid balance. In case of insolvency, stockholders cannot avoid liability to creditors by transferring their stock, except to persons legally capable of assuming the liability.¹ If stock is issued as fully paid, or in the absence of any provision showing that it is not fully paid, the purchaser in good faith is not liable for calls either for the corporation or for creditors even if the shares are not fully paid. If stock is fully paid, no assessment can be levied except as provided by statute or in the articles of incorporation. Voluntary contributions, however, are always in order. Even where statutes provide for assessment, an agreement may be made between the corporation and the stockholders against the exercise of the power. But the corporation does not have the power to sell shares for non-payment of assessments or calls, unless this power has been expressly granted. In many states the corporation has the power to sue the stockholder or sell the stock.

Liability to Creditors.—Stockholders are not ordinarily liable to creditors beyond the amount of their subscriptions. But any indebtedness to the corporation on account of their stock is subject to call to satisfy creditors in case of insolvency. The liability to creditors is several, however, and not joint. Each stockholder, regardless of others who might be insolvent, is liable to the full extent of his unpaid subscription to satisfy claims of creditors. Such stockholder, however, is entitled to contribution from the others to reimburse him.

When stockholders have claims against their corporation, they may apply these on their unpaid subscriptions, unless the corporation is insolvent and in the absence of creditors' claims. But stockholders cannot secure preference against other creditors through this means, they must pay their full amount due on subscription and then share their claims against the corporation along with other creditors.

Personal Liability of Stockholders.—As a rule, stockholders are liable for the debts of the corporation only to the extent of their subscriptions. But in a few states, for example, in Minnesota and California, additional liability is imposed by constitution or statute.

¹ BALLANTINE, *op. cit.*, p. 637.

In California the constitution makes each stockholder liable for the debts of the corporation incurred while he was a stockholder to the extent of his proportionate holdings. Action may be brought against stockholders individually by creditors on the basis of their liability. Generally stockholders in banks organized under the laws of the various states have double liability for debts. Stockholders in national banks are held equally and ratably for debts of the bank for an amount equal to the par value of the stock, in addition to the amount already subscribed as payment for the stock.

Joint-stock companies should be carefully distinguished from corporations. Shareholders in this type of organization stand in the same position as partners in a partnership and have unlimited liability for the debts of the company. The former subsidiaries of the American Railway Express Company are the chief representatives of joint-stock companies at the present time. This type of organization stands in an intermediate position between the partnership and the corporation and is rapidly passing away.

Watered Stock—In law, watered stock is stock issued as fully paid when the money, property, labor, or services accepted in payment for it are less than its par value or are of fictitious character. Watered stock may be issued by agreement for little or no consideration, or as a stock dividend when insufficient values lie back of the additional stock. Under the laws of most states watered stock is fraudulent as against future creditors, who may compel payment to the extent of the overvaluation if known to be excessive. But if valuation was made in good faith, mere mistakes of judgment create no liability. As a rule, stock-watering takes place at the time of promotion and organization of a new corporation. A board of dummy directors then issues stock to promoters in exchange for property or service, whereupon the promoters donate the stock back to the company as "treasury stock," which then may be sold for whatever it will bring. Such stock may be fully paid in the eyes of the law.

In deciding whether stock is watered or not, the courts have adopted one or the other of two rules, namely, the "true-value" or the "good-faith" rule. In the first, the attempt is made to find the true value of the property or services exchanged for the stock, while in the good-faith rule the determination by the board of directors is generally final in the absence of fraud or intentional overvaluation. But the courts have never developed an objective measure of value by which watered stock can be tested, largely because common-law shareholders' liability to creditors was made to rest upon the law of fraud. Consequently "directors and incorporators have been allowed to guess at the value of the consideration for which they have issued stock and the accuracy of their conjecture has been granted *prima facie* validity by the courts."¹ Stockholders

¹ DAVID L. DODD, *Stock Watering*, pp. 272-273

are liable to creditors for the excess of stock over valuable considerations received by the corporation. But the agreement between the corporation and the stockholders is nevertheless valid at law. Recovery by creditors against watered stock is generally difficult. In the first place, fraudulent overvaluation is difficult to prove; in the second place, innocent transferees are not generally liable. Stock bought in the open market on the assumption that it is fully paid relieves the purchaser of liability. The question generally turns on whether the purchaser was a *bona fide* purchaser and, if so, no third party is held liable. Liability cannot be avoided by transferring stock to an irresponsible person.¹

No-par Stock.—The entire question of stockholders' liability is avoided by means of issuing stock of no par value. As Ballantine remarks, "The great beauty of no-par stock is that the holder of the shares is not liable to creditors beyond the price fixed by the corporation."² This renders inapplicable laws and their interpretations relating to bonus and watered stock. New York in 1912 was the first state to authorize no-par stock. Since then many states have authorized similar issues: Maryland, 1916, California, Delaware, and Maine, 1917, Virginia, 1918, Massachusetts, New Jersey, Rhode Island, West Virginia, and Wisconsin, 1920, and Alabama, Colorado, Idaho, Kansas, Michigan, Missouri, North Carolina, and Utah, 1921, and so forth. At the present time at least 39 states and the Dominion of Canada have authorized no-par stock. Increasingly large numbers of industrial and public-utility corporations have made use of no-par stock. Particularly the holding company in these fields and the investment trust have seized the opportunity thus offered by the liberality of state laws.

Two kinds of no-par stock laws are found at the present time. The commoner type is where the law makes no requirement as to the amount of the capital stock in the certificate of incorporation. The other type requires a stated amount of capital, usually \$5 per share (New York requires only \$1), as a minimum and holds directors personally liable for debts if the stated amount has not been paid in cash, property, or services.

Stockholders of no-par stock are generally liable to pay the full price mentioned in the subscription agreement, unless the amount to be paid in is found in the certificate of incorporation, in which case that, instead of the agreement, fixes the liability. It may be observed that no-par stock may even be watered in case the property or service given in exchange is less than the stated value and the liability of the stockholder becomes essentially the same as in par-value stock.

A serious objection to no-par stock from the investor's point of view is that subsequent issues may be, and in practice are sold at prices lower than previous issues or are given in exchange for property with less per

¹ See BALLANTINE, *op. cit.*, Chap. XVII, Sec. B, II.

² *Op. cit.*, pp. 685-686.

share value. Control also may easily pass to a favored few in this way. On the other hand, the managers may exact a high price from the public through subsequent sale of new issues, which thus can be made to furnish most of the capital for the business. The stockholder is protected in some instances against unreasonably low prices of new issues by courts of equity.

Increase or Reduction of Capital Stock—Under common law, upon the issue of new stock, the old stockholders, whether preferred or common, have the right to subscribe for the new shares in proportion to their holdings. This protects each shareholder's portion of the accumulated profits in the surplus account, unless some provision to the contrary exists. A like rule holds in the case of reduction of the amount of the capital stock. Preferred stock must then be reduced in proportion to the common, unless other provision is made by statute or contract. The rule does not apply where there is a preference as to assets. The reduction in the amount of stock outstanding and increase in the value of each share improve the collateral value of the stock.

Lost Certificates.—Corporations may issue new certificates in case of lost, stolen, or destroyed ones. The corporation may, however, require the owner of the certificate to give a bond of indemnity against possible *bona fide* holders of the original certificate. The corporation can even be compelled to issue new certificates if bond is given, or if clear proof can be given of the disappearance of the original certificate, in which case no bond is required. The Uniform Stock Transfer Act requires that bond be given in cases of this kind, but the laws of some states do not require this.

Rights and Warrants.—A successful corporation desiring to raise new money will issue rights to the old stockholders to subscribe to new stock at a figure below the market price. This is legally possible only if the stock is selling considerably above par, since new issues cannot legally be sold for less than par. Certificates for rights are then distributed to the stockholders on a *pro rata* basis. The right to subscribe extends over a period of time varying according to the nature of the distribution of the stock. If broadly distributed among the public, the length of time is several months. During this period the rights may be traded in on the stock exchange, which gives opportunity for the holders to dispose of them, if desired, rather than exercise their privilege. Sometimes rights are attached to the new stock, and even to bond issues, in which cases they are designated as "warrants." These frequently run for years, during which time the stockholder may exercise his right. In all such cases, however, the subscription price is fixed considerably higher than the market price of the stock at the time of issue. This serves as an inducement to buy the new issue in times of prosperity and boom—the time when warrants and rights naturally flourish. In prac-

tice, warrants occasionally become valuable but the experience of the past 5 years has not been encouraging

Valuation of Rights.—In this connection the problem of the value of the right comes up For this purpose a right is defined as the privilege of purchase of new stock attached to one share of the old stock This is the New York right, the Philadelphia right refers to the privilege of purchasing one share of new stock To illustrate the method of valuing the New York right, assume the old stock is selling at \$150 and that old stockholders are given the privilege of subscribing to new stock at par, \$100, in the ratio of one new share for each ten of the old Simple arithmetic gives the most practical result although algebraic formulas have been devised Ten shares of the old stock are worth \$1,500, and, if to this is added the subscription price of the new share, the total value of all shares is \$1,600. Each share, after the exercise of the right, will be worth $\$145\frac{5}{11}$ One right, therefore, will be worth $\$4\frac{5}{11}$ This may be called the mathematical, theoretical, or parity value of the right It should be observed that the exercise of the right results in no gain to the subscriber, since the advantage in subscribing for the new share is offset by depreciation in the value of the old shares Should one fail to exercise his privilege or dispose of his right, he would to that extent suffer a positive loss If any gain is to result from the issue of rights, it must be in the additional distribution of dividends which results from the increase in the number of shares owned by the old stockholder It is ordinarily assumed that the price of the stock, sooner or later, will recover to its former price, since dividend distributions at the old rate are continued But this position has little theoretical or factual basis, since equities in both earnings and assets have been diluted through the exercise of the privilege

In case of warrants attached to bonds or preferred stocks for the purchase of common stock, the gain is real In these cases the price of the common stock rises to a point above the subscription price when the exercise of the privilege becomes profitable, without decreasing the fundamental equities back of the bond or preferred stock On the contrary, the equities are further increased which improves the quality of the senior issues themselves The gain then comes in the improved quality of senior securities and in the privilege of buying a common stock for less than it is worth on the market. The value of one right in this case would be equal to the difference between the subscription price of the new stock and the price of the old stock after rights have been exercised In the above illustration, if the right to buy one share of stock is attached to each \$1,000 bond, the right would be worth $\$45\frac{5}{11}$ That is the price it would probably command on the market

Preferred versus Common Stocks.—Thus far no distinction has been made between preferred and common stocks. Preferred stock is pre-

ferred only in the sense that it has been granted certain claims which are senior to those of common stock. They are, nevertheless, junior to the claims of all obligations which are promises to pay. From the standpoint of safety, the main provisions of preferred stock relate to assets and earnings. Stocks may be preferred in either one or both of these respects. The provisions are defined in the charter and by-laws of the corporation and are generally repeated in the certificates also. The provision of preference as to assets may be of value in case the corporation goes into liquidation. The full claims to the extent of the par value of the preferred must then be satisfied before anything can be paid on the common. It is pointed out, however, that, before liquidation descends upon the corporation, the assets have been so pledged in an effort to save the business that nothing remains for either the preferred or the common stockholder. If the corporation finally comes to receivership, the result does not depend so much upon the preference feature as upon the outcome of negotiations between committees seeking to rehabilitate the affairs of the company. Dr. Dewing concludes that experience with receiverships in practice shows that the preferred feature is "of more apparent than real significance."¹

Preference as to dividends is of more significance. This is the usual provision found in preferred stocks and assures the owner priority of claim over the common stock, upon which no declaration of dividends is possible without first providing the full amount specified on the preferred. The common stock is then entitled to dividends for the same year equal to the amount specified on the preferred. Unless prohibited in the charter or by-laws, or otherwise, any further dividends must be equally divided between the common and preferred in proportion to the amount of each outstanding.

Classified Preferred Stock—Preferred and common stocks are further complicated by classes of issues. The different classes of stock are designated in various ways but without uniform significance. Preferred stocks frequently bear such names as "prior preferred," "first" or "second preferred," "preferred A," or "B," "debenture stock," and so forth. Common stocks when subdivided are generally designated simply by letters, such as "common Class A," or "common Class B." The classification of both preferred and common is generally the result of reorganization where it is desirable to reduce bonded debt and fixed charges by replacing the issues concerned with stocks having various rights. The different classes are, therefore, the result of granting preference to certain issues in one or more respects. For instance, prior preference, first preferred, or preferred A stocks rank ahead of simple preferred, second preferred, or preferred B respectively with respect to assets in liquidation,

¹ *Financial Policy of Corporations*, Book I, p. 119.

current dividends, cumulative feature, voting power, or a combination of these rights.

Cumulative versus Non-cumulative Dividends.—In the absence of any provision, statement, or intention to the contrary, dividends on preferred stock are cumulative. But stock certificates usually specify whether they are cumulative or non-cumulative. Failure to declare cumulative dividends when due, therefore, results in arrears which must be paid off before the common stock can participate in distributions of earnings.

Earnings of prosperous years must be utilized to pay accumulated dividends on preferred before the common can receive anything. But preferred dividends may be expressly made to depend upon the profits of each year, in which case accumulation of dividends may take place, when not declared, only if the earnings of individual years are sufficient to cover dividends, or in so far as they are sufficient. Even if dividends are designated as non-cumulative, in case of failure to declare dividends when earnings are shown, accumulation of arrears must be settled before the common is entitled to receive anything. Declaration of earned dividends is, therefore, not a matter of discretion of the board of directors. In the case of participating dividends, the preferred is entitled to distributions of stock and scrip dividends according to their stated participation. Preferred stockholders may maintain a suit in equity for relief against the board of directors which has improperly declared a dividend on the common stock prior to declaration on the preferred. They may also maintain a suit to compel declaration of a dividend on the preferred in case of gross abuse of their discretion.

The legal position of the preference in stocks and the cumulative as against the non-cumulative dividend has been well stated by Prof Clifford M. Hicks as follows:

Preferred stock is only common stock with a preference in the amount of yearly dividends (or it may be with other preferences too), but since common stock cannot be paid dividends unless earnings exist to cover them, so the preference can only operate when earnings exist which might be declared as dividends upon the common stock and in which the former may claim its right to precede. Cumulative provisions have, therefore, come to be attached in order to continue the preference into other periods and against the earnings of any period. Conversely, the non-cumulative provision stipulates that the preference shall not survive the fiscal period as a claim against the earnings of other periods. But the discretionary right of the directors to postpone the division of those earnings which were earned in other years, so giving rise to potential dividends and causing the preference to operate, can create no forfeiture of claim under the preference, since preferred stock is but common stock with a priority grant attached to it, and it is well recognized that there is no forfeiture on the part of common stock under such circumstances.¹

¹ *Temple Law Quarterly*, June, 1931, pp. 552-553

This article referred to in the footnote shows that the recent case in the Supreme Court of *Barclay v Wabash Railway Company*, 230 U S 197 (1930), was out of line with other precedents and that the issue was mistaken by the court.

The cumulative feature is undoubtedly an added strength to stocks as well as to income bonds. There are periods in the life of every corporation when in the interest of conservatism no dividends should be paid on either the common or the preferred stock. Especially is this true in the case of newly organized corporations, and if the dividends were not cumulative, there would be no question but that during such periods they never would be paid. This would be harmful with respect to both the principal and the income. It is also the common experience of corporations which previously had been unsuccessful for one reason or another, when the tide turns and earnings begin to pour in, that back dividends if cumulative are speedily made up in order to place the common in a favorable position. They never would have been paid without the cumulative feature. Some income bonds and common stocks, where there are several classes, also bear the cumulative feature as to earnings. The cumulative feature will doubtless prove of inestimable value to the holders of preferred stocks of many corporations previously successful but temporarily stricken by the unforeseen calamities of 1931-1932 and which for that reason were unable to meet dividend payments for a time.

Preference as to Assets.—In the absence of preference as to assets, common and preferred stocks share alike in the distribution of the assets of a corporation. This rule covers past undivided earnings or surplus as well as contributed capital in the event of liquidation. A liquidating dividend is an exception to the general rule that dividends on any class of stock may be paid only out of earnings and not out of capital. Preferred stocks are by contract frequently preferred as to assets in case these are distributed, say, at the time of dissolution. This preference may be at par value or at a stated figure above par. In case of no-par stock the preference must always be stated. Accumulated dividends on preferred stock must be made good out of assets before the common is entitled to anything in dissolution. Participations of preferred stock, along with the common beyond the preference, are upheld under English law, unless expressly deprived of this privilege. But this remains an unsettled question in American law.

The non-cumulative feature is only a standing invitation to the board of directors to default on dividend declaration, even though the earnings of the corporation are satisfactory. Refusal to take action diverts earnings to improvements, strengthens the common stock, and brings closer the day when dividends may be declared. Dividends may then be started on both common and preferred at the same time. In the

interval, however, the preferred stockholder has been cheated out of his just return on the investment, and the common stockholder has profited accordingly

Protective Features.—The tendency in security contracts during the past three decades has been to make names of less significance than formerly. The purity of type that once existed does not exist today. This change has come about doubtless through various causes, among which is the popularity of preferred issues. The unmistakable tendency is to make preferred stocks investment issues. But along with changes in this security has come a blurring of types with the result that names have largely become meaningless. The newer provisions may be for convenience grouped under several heads.

A group of provisions finding expression chiefly in preferred stock issues provides some limitation upon future extension of capitalization or debt. In order to protect junior security holders, such as debenture bondholders and preferred stockholders, against the issuing of securities senior in their claims, it is becoming quite general to include in the contract at the time of flotation a provision forbidding the issue of securities of senior lien, except by consent of a majority, or two-thirds or three-fourths, of the outstanding stocks or bonds. This provision is somewhat complicated when found in connection with holding companies and collateral trust bonds. In the latter case such a provision would furnish only limited protection because of the possibility of the subsidiary companies issuing securities of senior lien on the assets which are essentially the support of all holding company issues. A provision forbidding this would doubtless have wholesome results. Likewise, in connection with collateral trust bonds, the security may be ample at time of issue but the collateral deposited as security may itself be undermined by the issue of securities with prior claims by the parent corporations issuing the collateral trust bonds. There seems to be no way of preventing this in many cases, for the reason that the company pledging the collateral often has only partial or even no control of the corporations whose securities have been deposited as collateral. These provisions doubtless exercise a restraining influence in ordinary times on the management of a concern, especially if it be one inclined to looseness. In times of stress, however, as also in periods of extensive liquidation, tight money, falling prices, and stagnant markets, it is doubtful if this provision is effective in accomplishing what was intended. If the company is threatened with financial difficulties, or perhaps insolvency, it is comparatively easy to secure the consent of the requisite number of security holders in order to authorize prior-claim issues. Security holders would much rather choose this alternative than reorganization and receivership, which would entail severe actual losses to them. The easier as well as the wiser course is to grant the corporation per-

mission to borrow even though the step undermines outstanding stocks

Future Liens.—A provision of much greater value to the investor is that which forbids absolutely the issuing of senior securities while any of the current issue remains outstanding. This is sometimes found where no mortgage may be authorized but such a provision covering senior issues in general is almost non-existent. Such a provision would from the outset exercise a wholesome and restraining influence upon unconservative managements, it would put a curb upon undue expansion and reckless enthusiasm in times of rising prices and prosperity. The real test of a management comes at such times and the one which provides for the emergencies of falling prices and liquidation which are sure to come, is the one which will survive and be ready for the next upward swing in business.

The chief cause of disaster in periods of financial and commercial stress is perhaps the existence of an unmanageable floating debt whose origin dates in the immediately preceding period of prosperity. Security holders, especially stockholders, may have their position weakened as surely by a large floating debt as by the issue of long-time securities of senior lien. The current creditors take precedence over the stockholders, which in itself may endanger their holdings. Furthermore, it is more than likely that a corporation, when it becomes necessary to pay the floating debt, will take almost the only course open to it by issuing senior securities in order to fund the floating debt and provide more working capital. Thus a floating debt commonly becomes a more or less permanent debt. At the present time this is of such universal occurrence that it is an outstanding evil which threatens preferred and common stockholders everywhere. Yet it is only rarely that these security holders are protected against the creation of relatively large floating debts. It would be an unwise restriction that would prevent any current borrowing on the part of a corporation, since this is the most patent fact in the conduct of modern business. The amount may, however, be limited in the interest of conservative management and safety.

In order to afford protection to preferred stockholders, the custom is now becoming quite usual to allow no new issues of stock of equal claims without the authorization from a high percentage of the stock outstanding. It is theoretically possible to strengthen outstanding preferred stock by issuing more of the same kind in cases where the equity behind the existing stock is thin; this condition, however, is of no practical importance, since such new preferred stock would find almost no market. On the other hand, where the equity is large, the issue of new preferred only reduces the amount behind the stock already outstanding.

The position of the common stockholder is the weakest of any class of security holders. The common stockholder as an individual is generally powerless to prevent the issue of preferred stock. It is true that after incorporation, unless prohibited by statute, the issue of preferred stock is conditioned upon the assent of every stockholder. This provision, however, has been considered as unduly restrictive in the expansion of business, therefore, many states have provided that by a prescribed majority of the outstanding stock preferred stock may be issued. The power of the majority is more nominal than real even under this provision. If the privilege of issuing preferred stock were denied the board of directors, it still possesses the power of incurring indebtedness which if resorted to would place both the corporation and the stockholders in a still more precarious position. In sum, therefore, the stockholder is without effective power to prohibit senior liens being placed ahead of his claims.

Asset Provisions—Following the war, many corporations found it necessary to appeal to the general public for funds which would ordinarily have been secured from commercial banks. But owing to the inflated condition of banks their funds became exhausted, and the only available source of new funds for current operations was the investing public. This led investment bankers to adopt commercial banking standards in the issue of preferred stocks, notes, and short-time bonds. Such flotations were looked upon merely as deferred bank loans, and it was natural to follow commercial banking standards in these issues. One form which this assumes is the requirement that the company maintain net quick assets to the extent of 100 or 150 per cent of the issue affected, or a higher ratio of net tangible assets to the same issue. Another common form is the requirement that current or quick assets bear a minimum ratio to current or quick liabilities—that is, a satisfactory current ratio. The percentage varies from 125 upward, depending upon the nature of the business in which the company is engaged and other factors of uncertain calculation. As a matter of fact most of the requirements are only a modification of provisions which have to do exclusively with fixed assets. In this connection the common provision in public-utility issues forbidding the mortgaging of new extensions beyond a fixed percentage of the plant may be recalled. The recent provisions are new mainly in the sense that they apply to current assets.

What are the merits of these banking standards as applied to investment issues? The consensus of investment bankers' opinions is that they have had a good influence on industrial corporations where they are found exclusively. It is in the interest of conservatism that such standards be held up as an ideal even though in practice it may not always be possible to adhere rigidly to them. Much will depend upon the wisdom

with which they are applied in each case. The management must not be unduly restricted in its operation, but there is less danger of erring in this respect than committing the sin of overexpansion, which is universally conceded to be the chief underlying cause of most business failures. By such financing doubtless many corporations were saved from insolvency during the past 5 years. Nevertheless, financing of this nature was largely of the emergency sort and resorted to only after banking funds were exhausted and, therefore, represented additional expansion at a time when conservatism should have been the watchword. Many of the loans thus effected, however, were for the purpose of tiding over the strain in business and paying maturing bank loans. Having once come into common use such provisions now seem to have become a regular feature of industrial financing. The real danger seems to be that commercial banks in making their loans will fail to take such obligations into account in fixing their lines of credit. This would result in both investment and commercial bankers resting their credit analysis upon the same net current assets. If the investment contract contained a provision in some way limiting the extent of current borrowing, such issues would be much stronger.

Earnings Provisions.—Preferred-stock covenants often contain a provision restricting the future issue of preferred stock unless earnings applicable to the stock measure up to a certain standard. This standard will vary, according to circumstances, from two to three times the dividend requirements on the issue for one or more years preceding. If there is a sinking fund attached to the issue, it is generally included in the restriction. It is, also, frequently provided that no dividends shall be paid on the common stock, unless the disbursement would reduce the current ratio or net asset requirements below the specified amount, regardless of the current earnings. The earnings restriction upon future issues can be made a desirable influence provided the period covered by the restriction is long enough, say, 5 or more years, and the number of times dividends are earned does not fall below a minimum which would be recognized as proper for the kind of business concerned.

An Example.—The protective provisions affecting the preferred stock of the Spicer Manufacturing Corporation issued in April, 1921, are given below as typical.

DESCRIPTION OF PREFERRED STOCK

The charter of the corporation, as amended, provides among other things, substantially as follows.

a. The preferred stock shall be entitled to 8 per cent cumulative dividends, payable quarterly on the first days of January, April, July, and October of each year, and shall be redeemable in whole or in part at any time after 3 years from the issue thereof on any dividend payment date on not less than 30 days' notice at 110 and accumulated and unpaid dividends thereon.

b Except as otherwise required by the Statutes of the State of Virginia the holder of the preferred stock shall have no voting power unless and until default shall be made in the payment of two quarterly dividends thereon and thereafter until such default and all defaults subsequent thereto shall have been made good, the entire voting power shall be vested in the holders of the preferred stock. Otherwise, the entire voting power shall be vested exclusively in the holders of the common stock.

c Preferred stock in excess of \$3,000,000 par value will not be issued unless the net earnings applicable to dividends for 12 out of the 14 months immediately preceding shall be at least equivalent to $2\frac{1}{2}$ times the dividends on the outstanding preferred stock, plus the amount of preferred stock to be issued.

d Preferred stock shall not be issued for property unless the par value of the stock does not exceed 80 per cent of the appraised value of the net tangible assets to be acquired.

e. No mortgage shall be placed on the properties of the corporation, or of the subsidiary or affiliated company, or any preferred stock issued on a parity with, or having preference over, the preferred stock if the holders of one-third of the issued and outstanding preferred stock object at a meeting called and held for the purpose.

f. On or before the first of January, 1921, a sinking fund is to be established and maintained for the purchase of the preferred stock, payments to which sinking fund for the first 5 years shall be at least equivalent in each year to 3 per cent of the largest amount of preferred stock outstanding, and thereafter at least equivalent to 5 per cent of the largest amount of preferred stock outstanding.

g The preferred stock to be preferred as to assets on liquidation or dissolution to the extent of 100 per cent of its par value, together with accumulated and unpaid dividends thereon; if such liquidation or dissolution be voluntary, however, the holders of the preferred stock shall be entitled to receive a further amount equal to 10 per cent of its par value.

h No dividends shall be paid on the common stock until after payment, or provision made for payment, of preferred stock dividend, and unless quick assets less all debts maturing one year or less equal the amount of the preferred stock outstanding.

Class A Common Stock.—Within recent years a new class of stock has become common on the market. This is the "Class A" common stock. To distinguish it from the remaining common stock, the latter is frequently called "Class B" common. In any event, it is usual for Class A stock to have no vote. It is strictly an investment stock and designed to offer the public participation in the profits of the corporation through a liberal dividend, while surrendering the control to the Class B stock, of which only a handful is usually issued. The two classes of stock of the Bethlehem Steel Company are precisely alike except for the voting power. But the usual custom is to limit the dividend on Class A stock and give it a preference over other classes. To all intents and purposes it is a new species of preferred stock except in name and legal position. The uncertainty regarding the dividend status of

preferred stock has probably been a force in the common use of this new class of investment issue. Class A stock, however, is seldom as strong as preferred stock, since there is usually little, if any, equity in the junior issues which could stand as a protection as is the case in preferred stock. Class A stock seems to be in the position of taking all of the risk and allowing the profits to go to others. Few will look upon this as a salutary influence. In order to strengthen its position, this class of stock is frequently made participating on some basis, in which case its value may be considerably enhanced.

Position in Reorganization—It appears that there can be no such thing as a gilt-edged stock, for nothing is guaranteed as in the case of promises to pay. No matter how strong the other elements of security are, therefore, a share of stock must always lack contractual assurance to the investor. From this angle all promises to pay are superior to certificates of ownership.

The ultimate test of the worth of an investment security, whether a bond or stock, comes at the time of failure followed by receivership and reorganization. At such times the courts have generally nullified all promises to pay and have taken as their chief guiding principle in the rehabilitation of the affairs of the corporation the rule of priority. They have recognized no essential difference between bondholders and stockholders. All alike is grist that comes to the mill of the receiver's court. The legal distinction as to the difference in kind is obliterated and becomes only a difference in degree, in priority of claims. As a rule, the security holders are not paid in money or property for their claims. If the corporation is one whose service to society is regarded as indispensable, the court will take this as the starting point and proceed to set its affairs in order, demanding of the equitable interests represented, sacrifice in reverse ratio to the priority of claim. Strongly secured bondholders will perhaps come clear, that is, their holdings remain undisturbed. Junior bondholders will be required to make some sacrifice, while stockholders, both preferred and common, will have to bear the brunt of the loss. If an assessment is to be made in order to secure cash for the continuance of the business, junior bondholders, with preferred and common stockholders, will be called upon to contribute their share. The common stockholders are assessed upon a principle similar to that known in rate-making as "what the traffic will bear." The preferred stockholders may be required to make some contribution, while holders of first claims receive the best treatment, generally escaping without any assessment at all.

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CHAPTER XIII

MANAGEMENT ELEMENT OF CREDIT

Personal Element in Credit—In the nature of the case, there seems to be little room for doubt that the personal element was the original element in credit. In the dawn of social life, doubtless personal relationships were about the only ties that cemented people together. The family, the clan, and the tribe all were held together through blood relations and the marriage vow. Indeed, during these dim times, law and order had no formal sanction. Governments had not yet begun to function. Laws were non-existent and custom and tradition ruled all of the important affairs of life. Nor was there much property or reserve value of any kind and what did exist was largely of communal ownership. In such a situation, economic relations between members of the community were mostly of passing interest. But with the individualization of economic interests that came as the community was enlarged and the blood ties relaxed, arose individual agreements pledging the parties concerned to the performance of certain covenants. These frequently involved the transfer of values from one person to another on condition that restoration take place in the future. But this very restoration itself depended upon the pledged word in the absence of law, it depended also upon the ability of the borrower to produce and accumulate something in the future, the lack of which gave rise to the lending. It was thus that personal ability and good faith in agreements constituted almost the whole of the credit structure.

The personal elements, ability and good faith, have not lost their meaning in modern credit. Today, however, they stand alongside the three other elements of income, assets, and contract to complete the credit structure. They are thus recognized by credit men who emphasize the three C's of capital, capacity, and character in short-time credit. Bankers frequently overemphasize the personal element and occasionally rest their case entirely upon the matter of character with perhaps an implied ability in the background. In capitalistic society, the earning power of capital supplements personal ability to earn something, while the capital itself stands as an added bulwark back of investments. In order to render personal covenants more secure and define precise relationships, laws and constitutions now specify standard relationships between contracting parties. Back of these is the arm of the government which sees to the enforcement of agreements entered into. Never-

theless, it would be a great mistake to suppose that the law is inclusive in its scope. Many of the most vital parts of the credit structure still depend upon the personal qualities of ability and moral integrity and he without the law. It is these in modern financial relationships that are in mind in the present discussion.

Specialization of Management.—Modern management is highly specialized. It is the fashion of economists to speak at length of the division of labor and specialization but seldom do they stop to analyze specialization. When industry was on a small scale, a single person performed all of the functions of management and besides often did much of the labor himself. So today still, farmers and operators of small shops, as well as professional men, combine most if not all of the functions originally performed by management.

Modern management of large-scale industry, however, is highly specialized. First, there is the board of directors with its executive committee, which is the heart of management. It establishes general policies for the control of the business in its entirety. But the various subsidiary companies, branches, and agencies have their own methods of working out the general policies established by the centralized authority. Capable men will not work under orders which stifle the imagination and kill their personality. Good management today implies functional responsibility on the part of all executive heads. Likewise, in the individual establishment subdivision and specialization of function have gone far to the end that the men in charge will have a free hand each to show his special ability. Here come factory superintendents, technicians of all kinds, sales and advertising specialists, and the like. Modern organization gives a flexibility to management which never could be attained by autocratic centralized control of the different departments of production and trade.

The Investment Banker.—But modern management does not end with the immediate organization itself. Back of the business stands the investment banker who has relieved the management to a large extent of the financial function. The investment banker stands as the link between the business establishment with its demand for new capital and the investing public which possesses no way of forming a direct contact with those who demand the capital. A permanent alliance between the banker and the business is undoubtedly desirable, since this relieves the management from financial worries and enables it to devote its attention to the business for which the organization exists. Moreover, modern finance is exceedingly complex and much of it highly specialized in character, so that a specialized group of men can best render the service demanded.

From the social as well as the individual point of view, the investment banker renders an incalculable service. He stands at the gates of finance,

directing the savings of society to the various fields of investment, taking care to guard their integrity for his clients. Perhaps not much over one-tenth of the promotion and finance schemes that are presented to him ever see the light of day. His sense of business soundness leads him almost instinctively to detect the weaknesses of proffered schemes. He thus selects for the great body of public investors only those fields of enterprise which have been tested and found sound. Securities offered through the personal promoter or salesman without banking connections are almost sure to possess fatal weaknesses. By thus separating the worthy from the unworthy, the investment banker acts as the conservator of the savings of the public. The good name and reputation of the banker back of security issues are a moral guarantee which the investor would do well to require.

Two Aspects of Management—Whether one thinks of the management from the point of view of business organization or that of finance, two aspects of the question are constantly in mind. The board of directors and executive officers, like the investment bankers, occupy an intermediate position between the organization and the investing public. In the first place, the management has certain duties to the corporation as a business organization, and, in the second place, it is bound by the ties of finance to the security holders who have furnished the funds employed in the undertaking. In general, it may be said that the interest of the security holders is also the interest of the corporation. But this is not always the case and frequently there arises a conflict of motives which renders the problem difficult of just solution. But, regardless of this problem, management itself must always be tested both as to its ability to succeed in the business undertaken and as to the integrity and good faith which it shows in the preservation of the credit of the concern and in the fair treatment of its economic owners. Tests of ability command our attention first.

Importance of Management.—Management is often claimed to be the whole of success or failure. This position is undoubtedly extreme. Yet it is without doubt true that the influence of the management in all types of business undertakings is far-reaching. The most far-reaching effect of management may be observed in the foresight and intelligence exercised in the provision for future needs. An example of long-range planning is that of the American Telephone and Telegraph Company, which plans for more than a decade ahead. At the opposite extreme may be found the inefficient firms that expand their plants at every temporary increase in business, so that when the business relaxes, it finds itself burdened with capacity it does not need and perhaps with debts too.

In the nature of the case, long-range planning is most necessary in those industries which employ large amounts of capital. It is in these, too, that mistakes of planning are the most serious. The railroads and

utilities are examples of situations where foresight is at a premium. Railroads have throughout most of their history had to plan far ahead of the traffic. The secret of many of the railroad troubles at the present time lies in the failure of the territory to develop sufficiently to utilize intensively the railroad facilities provided many years ago. So the electric power companies find it necessary to install high-tension apparatus sufficient to carry several times the immediate load required. The hydro-electric generating plants are built many years ahead of the traffic finally expected or realized. It may be laid down as a general rule that the greater the relative importance the factor of capital is in any industry, the more important are foresight and planning. Conversely, the greater the importance of the labor element, the less long-range planning is necessary. Where labor is the main element in cost, expansion and contraction of the facilities necessary to meet the changing demands of business are relatively easy. Fixed expenses in such instances are small and will not burden the company in times of stress.

But long-range planning is not the whole of management. Just as important is the current operation of the establishment. Here the various superintendents of departments, the technicians, and the sales and advertising forces become of great importance. These men have to work with a given equipment and their task is largely that of efficient employment of the means at hand at the moment. Here the important matters are scientific management of the labor force, proper adaptation of each to his task, elimination of all loss from waste of time and material, the proper regimentation of the processes of production between the various departments, and the like. The objective test of management here is frequently physical data, such as unit product per man employed, fuel consumed per unit of product, and average speed of railway trains. Current operating efficiency is also tested by the operating and other financial ratios.

Nor should the sales organization be forgotten. Efficient organization of the sales force is one of the greatest importance in all competitive industry. Advertising campaigns should bear definite tangible results if their continuance is to be justified. The expenditure of huge sums on the general theory that advertising pays cannot be justified. Extreme cases of risk and waste in advertising are found in the case of the tobacco companies where a third or more of their net income is spent in this way. The highly competitive character of this industry renders this procedure especially hazardous. The great impetus for increased consumption of cigarettes apparently originated as a by-product of the World War. Neither this nor the habit of smoking by women can be accredited to advertising campaigns. Advertising here becomes merely wasteful competition among the various companies in order that each company may get its share of the trade. Industries finding themselves in this situation are essentially weak, since after the saturation point is reached no further

returns can come through advertising. The automobile industry has already reached that stage and the companies now find themselves burdened in meeting expenses in extravagant magazine advertising and radio programs. In these instances, efficiency cannot go beyond the point of survival for the industry and perhaps not much farther in the case of the individual company.

Devotion to Task.—The strenuous demands on business today render it necessary that the management devote its entire energies to the affairs of the organization. There was a time, when the country was developing rapidly, when the strong upward trend in the transportation and other industries insured success with the minimum amount of attention to the business. Needless to say, that time has passed. No longer is it possible for one management to serve two masters. Adam Smith warned over 150 years ago against the mistake of trying to serve two masters. No management today can hope to succeed in business when it has one eye on the stock market with a view to personal profit. The days of Daniel Drew and Jay Gould are past forever. It may also be very much questioned whether the speculative activities of the management in the interest of the company itself, in the purchase of raw materials far ahead of the time when they are to be utilized, results in any gain in the long run. The experiences of the textile, rubber, and other industries of the past decade speak volumes against such a practice.

The eye of the management should be centered on the single object of obedience to economic laws. Personal ambitions to create a place in the sun for one's self too often result in the white elephants of useless capital investment which will plague the company in the future. The senseless combinations of corporations into huge uncoordinated units is sure to result in failure. The attempt to combine unlike things violates a most fundamental economic law. Mere similarity at one point is an insufficient basis for consolidation. The essential processes themselves must be capable of close coordination if consolidations are to succeed. The final decision in a program of expansion, whatever method employed, should hinge upon the economic advantage of the step itself. The accumulation of surplus is in itself a danger to many concerns which then regard it obligatory to find some method of employment of the funds. Far better had this surplus been distributed to the stockholders who individually might then find profitable employment for it in diversified investments. Industry today needs a regeneration of purpose, to the end that excellence shall supplant bigness.

Maintenance of Property.—In its relation to the corporation, the management has a special duty laid upon it to maintain the property in proper repair and operating condition. This is important from the standpoint of efficient operation and current earnings, as well as from the standpoint of the essential equity back of the security issues outstanding.

For the want of property repairs and maintenance, many railroads have in the past met the receiver. It is almost an invariable rule that, whatever business it may be engaged in, when a concern finally has to succumb to the pains of reorganization, it finds its capital in a run-down condition. If this had been maintained so that operating expenses could have been held at a minimum, failure might have been averted. But frequently the management is so bent upon making a good showing in net earnings that it neglects to spend the proper amount on these items and the only result is mounting expenses of operation. Following closely upon this trend is the declining credit and inability to secure the necessary funds for current needs. The protection of the company's credit should be the highest ideal of the management. When credit is once gone, business begins to fail so that economic and financial disaster is the inevitable result.

Relation to Labor and Personnel.—One of the most imperative requirements of modern management today is that it follow an enlightened policy with respect to both labor and the executive force. It must be recognized that labor has a stake in the industry which is quite as important as capital's stake. Simple justice would seem to require that employment be continuous in so far as it is within the powers of the management to provide it. Wages must be just and the labor force consulted in the establishment of a proper scale. Likewise, it must be recognized that the executive force is the crucial link in the success of the organization. It must be given a participation in the results which are clearly a product of its effort. Executives nowadays are for the most part hired servants and in order to get the best out of them participation in profits must be definite. The same argument applies in a less conclusive way to the labor force. But here it is difficult to trace definitely the result of special effort, so that the case must rest mainly upon grounds of simple justice.

Progressive Management.—Management should strive to lead instead of merely keeping its place in the industry in which it finds itself. In order to lead, it is necessary to be scientifically alert. Management must be able to make its own future in the advance in the technical equipment and in the devising of new products. For this purpose progressive managements have established research departments, in which are employed large forces of chemists, engineers, and other technically equipped men, who devise new methods and products designed to reduce costs and draw new business when old products fail. Outstanding in this field is the electrical equipment industry where invention and obsolescence of equipment are rapid. Newer uses for electricity are constantly being found through the efforts of the research department in devising new applications of power in the home and industry. The present age is a scientific age and the company which rests in the false security of a name or trademark, once efficacious, may awake to find the

substance of its former glory vanished. The importance of progressive management is all the more appreciated when it is remembered that progress or retrogression is the order of the day. It may be taken for granted that no business organization can merely stand still and in the end save itself. These remarks apply not only to the technical field of production but also to sales methods in wholesale and retail industries. Progressive management gave us the chain store with its greater service to the buying public. For years it was sufficient that the merchant inform his customers concerning his goods, but today amidst the complexity of products from which to choose it is necessary that the customer be allowed to follow his own inclination in the choice of products and thus adapt his purchasing to his own needs.

Good Faith.—One turns now to the other side of the personal factor in credit, namely, the good faith of the management. Good faith is a moral quality and finds application chiefly in the relation of the management to the security holders, but is also significant with respect to the attitude of the management toward the business with whose success it is charged. Bondholders and stockholders alike may be vitally affected by failure of the management to appreciate its obligation to them. The idea of good faith is concretely presented by Dr. Ralph E. Helman in the following passage:

Instances abound in which business morals do not conform to personal morals. Men who would not dream of stealing from a neighbor have adulterated goods to be sold to unknown or far distant purchasers. Others who would not think of committing perjury have engaged in over-appraisal of real estate and equipment as a basis for bond issues. Industrialists, kindly in all the personal relations of life, have been responsible for inhuman conditions of employment in large-scale, corporate-owned industrial plants. Financiers, who do not customarily make misleading statements to their business associates, have sold excessive issues of greatly diluted stock to the investing public with slight prospect of returns to investors. Corporate directors who would not contemplate forgery have proved insensitive to their fiduciary obligations from which they profited personally at the expense of the stockholders. Individuals in charge of financial houses, ordinarily honest in giving personal advice upon investments, have formed investment trusts and used them as devices to unload doubtful securities. The Dr. Jekyll of private life is all too often the Mr. Hyde of business life.¹

Changing Attitude.—That the attitude of the management toward security holders is steadily improving is evident in many ways. Perhaps the most lucid statement of this changing attitude of executives is found in the words of Alfred P. Sloan, Jr., president of General Motors Corporation. His words are as follows:

The enormous scale upon which business is now done has not only changed the methods of industrial management, but it has also brought about an entirely new

¹ *Ethical Problems of Modern Finance*, pp. 5-6, Vawter Lectures, Northwestern University.

conception of the relation of business to the public. There was a time when corporations of large size were so new that it was natural for the men who created them to feel that they owned them in the old sense of private ownership of a purely personal business. They resented the idea that the public should be told anything about their internal condition, just as much as they would have resented the idea that the public should be told anything about their intimate family life. "The public be damned" was a natural enough reaction of these pioneers in corporation management.

Of course, this attitude has altogether changed. There may be, here and there, a corporation executive who still feels resentful of public curiosity about his company's affairs, but I cannot recall such a one among my acquaintance. The men I know belong to a generation deeply conscious of the public interest that is implicit in the operations of a great corporation. An industry that numbers its stockholders by the thousands among the mass of the citizenry of the country cannot ignore the right of these thousands, or of the millions from whom they are drawn, to know all that there is to know about the business in which they have invested their money.

Investment by the public in the securities of a great corporation is an act of faith as well as an act of judgment. That faith must be justified, not only by the good faith of the management, but also by the management's making accessible to the public all the facts that are necessary for the formation of that judgment. And as the facts about the business change, the public must be informed of the changes, for these alter the conditions of their investment, and they are entitled to know about them.

Recognition of Good Faith as an Element in Credit—About a decade ago in an address before the Bond Men's club of Philadelphia, Elisha Lee, vice-president of the Pennsylvania Railroad, used these words:

The owners of railroad bonds may justly claim not only the highest conceivable legal, but also *moral right* [it takes mine] to expect that the integrity of their savings and investments will be fully protected. I stress the moral element because it enters into the value and stability of investments just as surely as do legal and economic consideration.

This is not only an emphatic recognition of the importance of the good-faith or moral element, but it clearly expresses the primary elements which enter into the determination of the degree of safety of all investments. As early as 1911 the author of the first important treatise on bond investments in speaking of municipal bonds said. "Although prosperity is the best guaranty of debt-payment, and law an able second, and good faith easily influenced by prosperity and legality, yet it is a thing apart, and may and does exist and support the credit of loans which are backed by neither of the other two"¹. Again, "The credit of a city or town is in no way different from that of a firm or individual"².

The value of good faith in industry is forcefully illustrated by the attitude of Stanley Baldwin, formerly prime minister of England. The

¹ LAWRENCE CHAMBERLAIN, *The Principles of Bond Investment*, p. 235

² *Ibid*, p. 237

members of this family have been identified with the iron industry since the days of Charles II. Mr. Baldwin stood by and refused to part with his stock in the face of adverse conditions and a downward trend of the iron industry in England. He says in defense of his position,

It may have been bad business on my part—many modern business men say it was—I ought to have sold at the top of the market. But when you have an old name in business against which nothing has ever been said, when you know the public has come into business on the strength of that name, it is an impossibility to throw your shares on the market when you know that in all human probability the loss will fall on them, not on you.¹

The development of good faith in financial affairs may be compared with the slow and steady growth of the sturdy oak, it takes time to bring it to maturity but when once fully developed it withstands the roughest and most inhospitable of the elements. New corporations just starting on their financial career; new governments just launched in their political existence; both alike have their moral character, their individuality, or record to make. The personnel may from the beginning impart something of its character and financial integrity to them, the business or government as a unit, however, has its future before it. Good or bad faith here is a matter of future development, it looks backward rather than forward. Managements and political parties come and go, but the individuality of the organization remains, perhaps somewhat modified or changed from time to time. Yet stability and integrity of character once developed usually change but slowly. The saying that the future may be judged by the past has peculiar application here.

Character of Basic Importance.—Although financial integrity is not superficially associated with business morality, the two have their roots in basic moral character itself. Financial integrity has to do with the legal and economic relationship existing between the organization and the owners of the business, the stockholders, its bondholders and other creditors. Business morality has to do with the relationship existing between the management and the customers of the business—the trade relations of the concern. Conceivably, financial integrity may be high and, at the same time, business morality low. The successful corporation may regard the ground upon which its financial sponsors tread as holy, while, at the same time, it may resort to questionable trade practices. Financial default soon becomes widely known and affects large numbers of investors at the same time, while business matters are strictly personal in character. Yet in spite of this distinction between financial and business morality, the two proceed from the same fundamental quality in character itself. Moral depravity in trade will surely affect financial

¹ *Wall Street Journal*, Jan. 28, 1931.

integrity if opportunity presents itself. Good faith is, therefore, at bottom a question of general character

Keeping the Contract.—Good faith is particularly important in the case of foreign loans. The practical impossibility of a citizen of one country resorting to force to compel a corporation of another country to abide by the terms of its contract makes necessary careful scrutiny of its past record for prompt discharge of its obligations. The English people have earned an enviable reputation in finance for keeping their word, so that today the word of an Englishman the world over is taken at par. It is not an accident that the British Government was the first to make permanent settlement with the United States for its war obligations. By this act it removed any lingering doubts as to its intention of maintaining the high credit position of the English people throughout the world.

Good faith is especially important in all government contracts. There is ordinarily no adequate remedy at the hand of the investor who holds the bonds of his government should it fail to keep its covenants. American state governments and municipalities in the past have more than once failed to abide by their agreements to the detriment of the lenders and the ruination of their own credit. In the case of municipalities, even the state governments have frequently been either powerless or indisposed to enforce the payment of just debts. The abuse of the sinking-fund agreements in the past has not always resulted in inspiring confidence in these provisions of government issues. It has been truly said that there is no bond so hopeless as a bad government bond. This is because so much depends upon the good faith of the government.

Although private contracts are enforceable at law, everyone knows that their substance is often devitalized through the shortcomings of human nature and the ingenuity of lawyers. Mortgage indentures are generally so long, frequently running as high as 200 printed pages, that on the average not one investor in ten thousand takes the trouble to read them. Even if one did read such contracts, the mass of legal verbiage would obscure the facts intended to be conveyed. The banker and the corporation must be trusted in most investment contracts to see that they contain nothing inimical to the interest of investors. Furthermore, the position of the trustee is uncertain and although he apparently possesses great power, in reality he exercises but little. The enforcement of most of the minor provisions and sometimes major considerations depends mostly on the good faith of the obligor. His past record in such matters is more to be trusted than the wording of the contract. This is made the more necessary from the fact that it is more or less impracticable for the holders of a particular issue to get together for united action, which might be necessary in order to get fair treatment.

Good faith takes on special importance at the time of reorganization of a corporation. At such a time certain contractual provisions are forgotten according to the public necessities of the case. Bondholders, as well as stockholders whose certificates have been fully paid, are by law non-assessable either for future requirements of the corporation or for the payment of debts. Yet both bondholders and stockholders are regularly called upon to furnish funds for these purposes when the financial affairs of the corporation have reached the breaking point. While it is not compulsory for the security holder to accept the terms of reorganization, he is, in fact, compelled to do so if he is to protect his investment. The sense of justice of the receiver's court and the protective committees has much to do with the final outcome in such instances. Assessments upon the stockholders and bondholders are frequently made on the principle of what the traffic will bear.

Accounting Methods.—The attitude of the management toward the corporation is revealed best through the kind of accounts it keeps. Only a few of the numerous illustrations available will be selected for illustration.

Perhaps the most glaring defect in modern accounting practice is the looseness with which the depreciation account is kept. Mr Lawrence H. Sloan remarks, "The most interesting fact about the depreciation policy of American industry is that there is none . . . Evidence of a common viewpoint on the part of the management of industry, or of a common conception, is wholly lacking."¹ The main defects of the depreciation account relate to inaccuracies in the amount charged, confusion with depletion charges in the case of mining companies, and lack of consistent policy from one year to another. These defects have two consequences for the investor: first, net earnings applicable to capital charges or dividends are often hopelessly unreliable, and, second, asset values back of bonds and stocks are impossible of determination. The difference between profit and loss is too often the result of the character of the depreciation policy. Sloan finds that, in the non-extractive industries, leading concerns on the average charged 5½ per cent on the property values. But 28 of these leading corporations in 1 year showed a regular progression in the depreciation charge from approximately 1 per cent to about 11 per cent, with one running as high as 17 per cent.² Combined depreciation charges of 35 identical companies varied from 76 to 140 from the average taken as 100 for the years 1921, 1923, 1926, and 1927.³

A second defect of published accounting is the failure in many instances to present adequate information concerning practically every account in the balance sheet. The property account is too frequently a

¹ *Corporation Profits*, p. 41.

² *Ibid.*, p. 53.

³ *Ibid.*, p. 58.

hopeless jumble of land, buildings, equipment, good-will, and so forth. Likewise the current asset account often fails to give any light upon the character of the inventory, the quality of its bills receivable, the method of valuing inventory, investments, and so forth. Often the balance sheet grossly overstates the equities back of securities and less often it conceals valuable assets which the investor would like to know about. It is not too much to ask that property accounts be kept so as to show the true state of the business at all times. There would then be less ground for the management, as well as the public, to be deceived as to the precise state of the business. Balance sheets should in reality show the accumulated results of the business over a period of time. They should reveal to both management and the public the degree of success which has attended operations. Additional investment in any industry or enterprise is justified only on the ground that a normal return for that type of business is realized over a series of years.

Overcapitalization.—One of the outstanding evils in the history of corporation finance has been the tendency to overcapitalization. Since there is little effective legal restraint against stockwatering, corporations have gone the way of simple business expediency. Even from this point of view, careful consideration of this matter from every angle would lead to the conclusion that the reasons for such a course are more imaginary than real. Besides, the injuries to credit which inevitably follow such a course far more than offset the possible advantages at the time of promotion. From the present point of view, the practice of stockwatering cannot be condemned in too severe terms. The corporation resorting to this practice sacrifices its credit standing, for it is an indication that someone wants to milk the concern. It will be harder to float long-time loans at a satisfactory rate of interest. Furthermore, it makes the payment of dividends on the stock unlikely for some time to come at least. The dividend record is a recognized element of credit with commercial banks. Poor credit, in turn, is reflected in the market price of all securities.

No class of security holders, outside of the common stockholders themselves, is affected by stockwatering as much as preferred stockholders. Preferred stock in such cases is usually in reality common stock, since it covers practically all of the margin of assets above bonds and notes. It is nothing less than deception to the investing public to float an issue of preferred stock which represents only the residual equity of property. No matter what the name of the security may be, if it represents only the margin of asset equity, it is in effect only a common stock. It will have to bear the brunt of the lean years and in turn will benefit little should the corporation prove successful, since the rate of return is in practice limited to the stipulated amount. It is also true that the securities of corporations whose finances have been distorted by over-

capitalization go at a discount on the market regardless of the equities back of them. What investor has full confidence in the securities of the Erie or the New Haven railroad? The consensus of the opinion of investors is registered in the market and in these cases it furnishes mute evidence of the low regard with which the securities of these railroads are held

Dividend Policy.—As previously explained, it has become a recognized tenet of finance that a successful business must grow. A management which merely marks time is not a success and the day is not far distant when the business will move backward if it cannot move forward. Moving forward in business means the accumulation of a surplus through earnings. It means internal growth, since it is impossible to grow by accretion alone. Internal growth inspires respect and commands better credit. Sound growth can be brought about only by retaining in the business a portion of earnings. Dividends on stock must not be excessive so as to leave little or nothing for the surplus account.

The aim of the management should be to maintain regularity of dividends. The stockholder is entitled to reasonable assurance that when dividends at a certain rate are declared they can be maintained through the ordinary ups and downs of business. Exceptional contingencies will at times arise, such as the outbreak of a disastrous war, which will necessitate the suspension of dividends in the interest of the corporation. The common stockholder of right must assume the burden of such risks. It is for undergoing such risks that he benefits most in times of prosperity. Dividends should not be so high that they are endangered by every adverse circumstance or rob the business of necessary funds.

The policy of the Pennsylvania Railroad or the United States Steel Corporation may be cited in this connection. Dividends are usually paid in bad, as well as in good, years; but the total amount of the dividends over a series of years would not exceed the amount of the earnings retained in the business. By this means large surplus accounts have been built up and the stocks of these companies have attained an enviable investment position. Confidence in the boards of directors of these corporations is superior from the credit point of view to the contract promises of many other corporations which are enforceable by law.

Where the earnings tend to fluctuate widely, a smaller proportion can with safety be paid out to the stockholders than where the earnings are more stable. The equities constantly being built up back of the common stock will accrue to the benefit of the owners through a higher price which it will command in the market. If a corporation finds that it has a surplus of funds beyond what is necessary for the business, the way is open for the declaration of extra dividends. These, however, should be extras and distributed in such a manner as not to create the impression of permanency. Continued extras are an abomination to the investor.

They create an element of uncertainty as to future disbursements and find expression in a fluctuating price for the stock. The reasons for continued extra dividends would be the same as for a higher regular rate or a stock dividend. But high dividend rates create suspicion on the part of the public, and criticism may often be avoided by the quiet declaration of a stock dividend, and following that the maintenance of regular rates on the entire amount outstanding. Everything possible should be done to relieve the stockholder of the uncertainty of dividend disbursements.

It is too often the case, however, that the officers in control of the business are not entirely free to put into effect the wisest policies. Frequently, the stockholders with the best of intentions, but out of sheer inability to choose the course best for all concerned, will unduly deflect the normal course of the board of directors away from sound financial practice. The pressure exerted by stockholders for the declaration of dividends will not infrequently jeopardize the financial future of the corporation. Corporations just starting in their business life are often induced through stockholders to distribute dividends when the funds had better be devoted to business needs. Such interference by stockholders in their mistaken zeal shows a lack of appreciation of the importance of the future both for the corporation and for themselves. A capable management should be given a free hand in the conduct of the finances of a business. Boards of directors are only human, but they are far more likely to show ability in management than the stockholders, who are only incidentally acquainted with the business which as investors they may also control.

If dividends are paid over a period of years without interruption, when sound financial policy would dictate otherwise, the result is likely to be either threatened or actual disaster. Corporation finance is replete with instances of this kind. Stockholders and debenture bondholders are then rudely awakened to the folly of such a practice, as they witness the sudden collapse in the market price of their holdings. It would have been far wiser for all concerned had dividends been discontinued years before and the financial affairs preserved in good order. The results for the security holders would not have been at the most more disastrous and probably much less. It is, therefore, a species of dishonesty for directors to continue the payment of dividends merely in order to maintain the appearance of success, while their financial house continues to become more and more disordered. It must be added here that lawmakers are partly guilty where this condition obtains. It is a common provision that in order for certain bonds to become legal investments for savings banks and other trust funds, dividends at a specified rate shall have been maintained for at least five years immediately preceding. Directors will often strain a point to comply with this provision. But where the purpose is to conceal unfavorable financial conditions, to maintain the market price of the

stock or junior bonds, or in order to create a market for a new issue of bonds, the management must be held responsible for the results

It may be rejoined that common stockholders by their purchase of this type of security assume certain risks and therefore have no complaint against the management for its actions. It is true there was a day in American finance when stockwatering, stock-jobbing, swindling, and robbery by methods of high finance in corporate affairs were expected and even condoned. Practically every industry has passed through this stage, the railroads first, public utilities following, and close upon their heels came the industrials. Today, however, thanks to an awakened public conscience, such methods of legal chicanery and financial plundering of the public by the insiders are looked upon as belonging to an age of primitive finance. With the development of corporations and a recognition of them as the only feasible method of conducting business on a modern scale, public conscience demands honesty in their dealings with the public. Certain business risks are inevitable and these of necessity fall heaviest upon the common stockholders. But it requires only a small amount of mental discernment to distinguish between necessary business risks, which are assumed as a matter of course by stockholders, and unnecessary risks occasioned by an unscrupulous board of directors. It is on account of such artificial risks that much gambling in stocks is induced.

Manipulation—In earlier days when financial plundering was still respected by a timid and ignorant public, manipulation of the financial affairs of a corporation gave the insiders a chance to foist the stock upon the public at an artificial price. It was a convenient matter to pay dividends at certain times and to withhold them at other times. Again, the concealing of information creates a situation in which undue speculation and outright gambling are encouraged. The officers may pay unduly high prices for materials and supplies from business concerns in which they are largely interested, thereby lessening the net profits available to the stockholders and reducing margins which are rightly expected by bondholders. Stockholders in holding companies may be deprived of their equities through the manipulation of the affairs of the subsidiaries by the board of directors and officers of the holding company. They are sometimes frozen out by the continued non-payment of dividends when the corporation could well afford to pay them and still keep within the bounds of conservative finance. These and other methods have been commonly used for the advantage of those in control and to the detriment of stockholders and bondholders. Directors and officers who thus disregard the interests of the security holders not only break the trust and confidence reposed in them, but often bring lasting injury to the corporation through impaired credit and reduced borrowing power.

Pyramiding.—Of all the evils in the realm of finance today pyramiding of one holding company on top of another is the crowning abuse. It has well-nigh spoiled the field of electric light and power companies for investment and has brought down the wrath of the federal authorities upon the industry. No industry is more inherently sound than this one, and none has had its finances so hopelessly jumbled. By the pyramiding of one company on top of another, equities have grown progressively thinner and thinner. The margin of earnings available for the last layer of securities vanishes at the first appearance of adversity. The instability of the holding company is a permanent disqualification for conservative investment. The very word "investment" suggests permanence and stability and neither of these is possible under the pyramiding process. The investor may suddenly awake to find what little substance there was back of his security has vanished overnight.

Not the least of the evils of pyramiding is the inability of the public to find out much about the underlying equities that may exist behind his security. Few companies publish statements of sufficient clarity to enable one to determine the real worth in assets and earnings of a given issue. The holding company is widely used and has recently been employed with great confusion in investment trusts. In all cases it has led to the loss by the stockholder of his control over the property, which is nominally his, to those who have little or no stake in the enterprise except personal profit. Such abuses as these are a provocation to government control over the industries represented.

Other Evils.—There is room for only brief mention of several other evils. Among them may be mentioned the abuse of minority stockholders' rights. Witness the attempt to barter away the Youngstown Sheet and Tube concern. Of considerable consequence is the misnaming of securities so as to add to their attractiveness. Particularly have the names "first mortgage," "first and refunding," "first lien," and "first refunding" been used to designate securities whose underlying values are other than those suggested by the title.¹ Mention should also be made of the potent evils attending the issue of no-par stock, split-ups, and subsequent reduction in capitalization with elimination of par value.

Publicity.—Lastly comes the general matter of publicity of corporate affairs. Publicity has been a matter of slow evolution. It first appeared in connection with corporations affected with a public interest in order that public supervision may be effectively exercised and rates regulated. This may be designated as compulsory publicity. This appeared first in connection with banks and insurance companies and later in all classes of public utilities beginning with the railroads. The reason in all of these cases was the nature of the business rather than the form

¹ See *Report of the Bond and Nomenclature Committee of the Investment Bankers' Association of America for 1928*

of organization. The next advance in publicity came when the corporation as a form of business organization began its expansion in the field of trusts. This gave rise to a demand for more effective publicity of corporate affairs as a protection to the consuming public. The third great step in this history came when the securities became so widely diffused among the public that the investor demanded the publication of facts lying back of his investment. A still broader reason for publicity exists in the social position of the corporation as the chief vehicle for the direction of the funds of the public into whatever industries promise the best results.¹

But other than legal forces have been at work within recent years to secure more satisfactory information. Among these may be numbered accounting and credit associations and the leadership of outstanding corporations, such as the United States Steel, General Motors, and the American Telephone and Telegraph Company. But without doubt the

TABLE 26 — FREQUENCY OF PUBLISHED INFORMATION

Class of corporation	Annual	Semi-annual	Quarterly	Monthly	Total
Steel	2	9	30	0	41
Machine appliances, electrical manufacturers, etc	18	21	49	0	88
Chemicals, drugs, soaps, etc	9	18	25	0	52
Banks, investment trusts, and insurance companies	16	12	12	0	40
Cement and tiling	0	0	7	0	7
Oil	9	6	29	0	44
Paper and printing	5	1	16	0	22
Food, packing, and leather	12	5	30	0	47
Sugar and candy	10	0	4	1	15
Utilities	10	2	26	18	56
Textiles	7	18	4	0	29
Autos and accessories	2	12	47	0	61
Mining and cable manufacturers	21	8	24	2	55
Ship and shipbuilding	4	2	2	1	9
Tobacco	9	5	7	0	21
Merchandising and department stores	24	21	11	1	57
Aviation	0	1	8	0	9
Amusements	0	0	13	0	13
Real estate	1	2	4	1	8
Miscellaneous	12	13	29	0	54
Total	171	156	377	24	728
Per cent of total	23.6	21.4	51.7	3.3	100

¹ Account taken from an unpublished thesis by Clifford M. Hicks, *Compulsory Publicity of Corporate Financial Affairs*, University of Nebraska.

strongest influence has been the New York exchange in its listing requirements. The most complete information regarding listed securities is now found in the files of the exchange. Besides listing requirements the exchange brings pressure to bear upon corporations to publish frequent earnings statements. The table on page 238 shows the frequency of earnings reports at the present time according to the leading classes of corporations.

Caveat Emptor.—The principle of *caveat emptor* (let the purchaser beware) prevailed in merchandising throughout the greater part of the history of civilization. This ideal itself was based upon the false economic doctrine that trade and commerce were carried on only for the benefit of one party. The true economic doctrine of mutual advantage in trade was still unknown. Hence trade was unpopular and associated with plundering and piracy on land and sea. Buccaneersing was a heroic occupation as late as three centuries ago. But today merchandising has been elevated to a position of public respect, thereby recognizing the mutual advantages in the exchange of products where division of labor exists. For the further elevation of trade in the public mind, associations have formulated codes and ethical principles. Fairness in competition and fairness to the consumer are becoming the watchwords of business.

Likewise, in the field of finance, principles of justice and openness are winning over the forces of secrecy and manipulation. Investment banking itself has risen to a high plane of conduct perhaps not exceeded by any other class of business. Nevertheless, the position of the banker is difficult. He must satisfy the organization from which he purchases his securities, while at the same time it is incumbent upon him to preserve high standards of safety and to protect his clients among the investing public. Amidst it all, the banker is a merchant in securities and must make sufficient profit to enable him to fulfil his social function as an intermediary agency. The profession clearly recognizes its obligation to give full and detailed information so that the investor may now see what he is buying. Thus the ancient merchandising principle of *caveat emptor* is being left behind. Bankers must look for their reward in the success of their clients instead of in mere skill in merchandising securities.

Management as Trustee.—The dependence of enterprise upon the public for funds and the ever-widening diffusion of ownership has placed the management in the position of trustee. The public not only owns all of the bonds of corporations but also the bulk of their stocks. Forty years ago corporations were still small and stockholders were few in number, most of them holding an office in the organization. The incentive that comes from identical ownership and management still played the important role. Today, however, all this is changed. The corporation, since that day, has undergone a metamorphosis from the closed type to the free and open organization of today. Seldom

in the larger corporations of the country does the management own a controlling interest and in many cases only an insignificant portion of the total stock outstanding

The reward of management in the individual or partnership form of organization was chiefly in the profitableness of the enterprise, the compensation for personal service being of minor importance. Today the situation is somewhat reversed. Big business has brought a high degree of specialization in management, it demands greater skill and effectiveness, and offers correspondingly larger salaries. Executives today are dependent mostly upon this form of reward. Even where a portion of the stock is owned by those connected with the management, salaries are likely to represent the larger share of their compensation. Competition for the higher executive positions is especially keen and the tendency is for salaries to advance higher and higher, thus offering an acceptable substitute for the share in profits which formerly prevailed.

With these conditions prevailing, the conception of manager as trustee does not appear to be at all inconsistent with the operation of business at a high degree of efficiency. While the main portion of the profits under diffused ownership must always go to the stockholders and bondholders, the compensation for the services of management is higher than ever in the history of enterprise. Aside from the question of reward for service, there is reason to believe that the divorce of management from ownership has already made an indelible impression upon business executives. In the nature of the case, management of other people's property, for which a high reward is paid, cannot long continue without the development of a sense of responsibility to those owners. This responsibility is for the preservation of values and the income that capital affords. Besides this separateness of interests, the assumption of the role of trusteeship of property by the managers has already brought certain forms of legal restriction on the use and management of property, especially in the field of enterprise affected with a public interest. Recent enactments by both federal and state authorities in the interest of the stockholders and bondholders in railroads and public utilities are a recognition of the altered conditions of business. The investor of today, as never before, moves in a field of comparative certainty. He may consider himself in a real sense as partner in the enterprise which employs his capital. He must also accept his share of the responsibility for fair treatment of labor to the end that tripartite industry continue its upward trend of progress.

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CHAPTER XIV

THE RATING OF SECURITIES

The idea of rating securities is comparatively new. For many years credit agencies have rated the commercial credit of business concerns. While the broad scope of the work of these agencies necessarily qualifies the result to some extent, nevertheless the rating systems of Bradstreet's and Dun's organizations are universally consulted. The rating of commercial credit is comparatively simple when compared with investment credit. Yet there are no insuperable obstacles in the road, and with proper approach and method there is no reason why investment securities cannot be rated to advantage. Security rating was first undertaken some 25 years ago by John Moody in connection with railroad bonds. Since that time rapid progress has been made until now every type of stocks and bonds, whether of a railroad, public utility, industrial organization, or governmental body, receives a rating.

The idea back of rating of securities is to assign to each issue a definite rate or rank based upon some one or more qualities sought. Ratings will differ, therefore, according to the qualities chosen. The investor should not lightly accept a given rating without knowing the purpose lying back of the rating system of a particular organization. Ratings are always assigned with reference to one or more qualities which may not be of prime consideration to the investor. One should study one's own requirements and modify the ratings of organizations to suit the circumstances.

Bases for Rating Securities.—Theoretically considered, securities may be rated for any quality desired. Many qualities are demanded by the average investor, who always makes it a point to become acquainted with the leading characteristics of the security before purchasing. For instance, the matter of marketability is considered an important feature by many. It would be possible to rate securities on the basis of this feature alone. Indeed, the leading services include a separate rating for marketability. Perhaps the most common feature included in the qualities considered by rating systems is the safety of the issue. In practice, the basis of rating resolves itself into consideration of features from three points of view: "ideal" investment, speculative chances, and safety.

In his work, *Principles of Bond Investment*, Lawrence Chamberlain finds 10 principal qualities that go to make up the ideal investment.¹

¹ LAWRENCE CHAMBERLAIN and G. W. EDWARDS, *The Principles of Bond Investment*, rev. ed., Chap. III.

The safety of the principal and stability of the income are mentioned as the most important. The ideal investment will also bring in a fair return, have ready marketability, reasonable freedom from burdensome taxes, exemption from care, and acceptable duration or denomination. The chances for appreciation of principal are also included among the desirable qualities. If this list of qualities represents those chiefly sought by investors, rating for general investment purposes would require that each quality be rated separately and the final rating be expressed by a symbol representing the composite result. This method of rating would have the advantages and defects of the broad basis upon which it rests. If the ratings for the individual qualities, as well as for the final result, were given, such a system would be of great value. It would involve an enormous amount of labor and expense, but the results would be good. Inasmuch as some of the qualities are likely to change frequently, it would also necessitate frequent revision. Such a rating system, however, would answer most of the questions put by the purchaser to the salesman. There is no system at the present time which rests its results on so broad a basis.

The second basis for rating would consider primarily the chances for speculative profits. These might result from an increase in the price of the issue through improved credit and success of the corporation or maker. Profits might also result to the stockholder from increased regular dividends, extras, or from stock dividends. This method would be especially applicable to income bonds of low standing, as, also, to convertible bonds, and either bonds or preferred stocks which carry a participating feature. Securities increase or decrease in value primarily from changing intrinsic merit or from market conditions. Increasing prospects of a company may show themselves in either long or short periods of time. Cyclical upswings in business bring temporarily increased earnings and may also result in permanent advantages to the business. On the other hand, when viewed from the longer standpoint, industries either make progress or decline over a decade or longer. Ratings may be made from either the cyclical or long-time prospects. Frequent revision would be necessary in the former, and considerable in the latter, case.

The third basis for rating is the relative safety of the principal and income to the exclusion of all other elements. This neglects all qualities not inherently a part of the issue itself. It has as its object the analysis of the intrinsic merit of the issue. No investment should ever be made without due regard to the chances of loss. This method looks at the matter primarily from the long-time point of view—the results of the decade—rather than from the immediate status or prospects. It separates securities into classes, with those regarded as absolutely safe—the gilt-edged type—at the top of the list, followed by those of different degrees of inferiority, down to the absolutely hopeless type. Whatever

else the investor demands in his commitments, he desires above all to know the chances of loss. He may not always select the security bearing the highest rating, but if he chooses one of inferior quality, he does so with his eyes open. Mistakes in judgment and understanding between investment banker and the customer are very common. A rating system which would set forth in clear light the chances of loss inherent in an issue would go far toward promoting confidence and avoiding unnecessary losses.

Moody's Rating System.—The general idea underlying the rating system developed by John Moody and his organization is set forth in a letter to the author dated March 9, 1921. In part, the letter reads as follows:

The first idea in my mind, in adopting a rating system, was to classify railroad bonds according to their mortgage security and general position in relation to the earnings of the property. This, of course, was very simple in cases where a railroad had outstanding only a few bond issues covering a definite section of its property. For example, a first-mortgage bond secured on a definite railroad line could be easily enough rated and a second mortgage on the same line could be given a rating without much danger. But when it came to the question of rating bonds secured on branch lines and bonds which were secured partly on one section of the property and partly by the deposit of collateral or in other ways, it was, of course, a serious problem as to how to give this bond a particular classification.

I found, therefore, in working up a rating system, I would have to take into consideration every factor involved. It would be necessary to ascertain the character of the territory which a particular piece of railroad operated, to pass judgment on the prospects for the development of business in that territory and also to take into consideration such questions as economic conditions, character of tonnage transported, volume of passenger business, character of management, average trend of business over a series of years and anything which had any relation whatever to the operation of the railroad. The mere fact that a bond was secured on a piece of property which had undoubtedly cost a great deal more to construct than the bond issue amounted to, would not necessarily indicate that the bond was a good investment.

I, therefore, finally worked out a system of valuation based on all the contributory factors in a given situation and then classified the bonds according to their relative position in the property and the relative importance of the particular mileage which might be covered directly or indirectly by the particular bond. Of course, earning power has a great deal to do with the value of any investment issue, especially where such an issue is secured on a going concern, but earning power fluctuates extremely in every line of business and in some years may be remarkably high while in other years there may be little or no profit in a business at all. Therefore, I adopted the principle of basing my judgment on a long period of time, making this period long enough to ordinarily take in a time of depression or reaction, as well as a time of prosperity. In the case of railroad ratings, I adopted a 10-year average as my basis for judging the investment value of the issues.

The rating system was devised altogether for the benefit of the investor, rather than the speculator. Therefore, in placing any ratings on securities, the main thought has been to indicate more or less permanent value rather than a temporary or speculative value. By judging the condition of a property as it has averaged over a reasonably long period, one can feel fairly safe in assuming that the future trend over a long period will be pretty well reflected by past results. The investor, whether he thinks so or not, is really interested in the longer future of the property rather than in its immediate outlook. Theoretically at least, he buys a bond for income purposes and expects to hold that bond for a reasonably long period. An investing institution, such as a savings bank, follows this idea on principle and although investing institutions frequently make changes in investments, yet the primary purpose is to place their money in securities which can be held until maturity.

This rating principle, originally worked out in the railroad field, has in the course of years spread to other fields. We have stuck to the general principles as closely as possible in classifying the securities of industrial, public utility, and other private corporations, and we have found that, as a general thing, the idea has proved practical and has worked out satisfactorily.

In the field of government and municipal obligations, the method of determining values has, of course, been somewhat different. Governments are not in business to show profits but, nevertheless, their financial condition is the main item which bears on the security and investment strength of their obligations. Therefore, the financial exhibit of the country, city or town which has securities outstanding, is the thing which is given first consideration by us. We also, of course, take into account the other special factors such as the geographical location, the trend of growth in population, the dependence of the municipality on certain lines of industry, the political situation and the past record over a series of years.

Naturally, no rating system of this kind can be worked out mathematically, or to an exact basis. The idea is to attempt to show relative values more than anything else and to give a reasonably close, approximate idea of the investment worth and standing of any particular security. These ratings are subject to readjustment from time to time as the factors which influence securities change, but it is surprising what a small percentage of the outstanding bonds and stocks of American corporations so change that ratings have to be adjusted at all. Of course, I am speaking of investments in this connection rather than speculative propositions. We rate speculative securities, but the ratings on speculative issues are always more tentative and we try to emphasize this fact. We eliminate as much as possible the speculative factors and try to supply ratings which are mainly placed on the intrinsic element which may be found in the speculative issues.

The Moody rating system rests fundamentally upon the risk involved in an issue. This is modified particularly in the case of stocks by the element of marketability. Bonds are regarded more from the permanent standpoint and, therefore, marketability is not of equal weight in rating them. Nevertheless, bond ratings are considerably modified by this element. The safety of an issue is estimated on the basis of contract or

priority of lien upon assets and income, the asset value, and the amount and stability of income

The method of procedure is first to arrive at what is called the "statistical rating" This is based upon separate statistical formulas for stocks and bonds as classes To quote from the volume on *Industrials* for 1923 with reference to bonds.

This formula embraces three primary factors, namely, asset value, earning power, and stability A properly weighted combination of these elements gives us what we call our "statistical rating" The so-called statistical rating is then put to test with various non-statistical factors which affect the investment value of nearly all bonds to more or less degree, the ultimate result of such test giving us the "final rating" which is the rating always used in the volume ¹

Assets hold a position of primary importance. In the rating of bonds in the tables under the column marked "security," bonds receive their classification according to one of the following designations very high, high, strong, good, fair, or poor In order to be classified as strong, a bond must have

plenty of assets back of it which would probably receive its face value in the event of liquidation A good bond is not necessarily one which has exceptional assets back of it, but is in a substantial position from the point of view of income results and has fair assets to give it strength A fair bond, of course, is one in a less assured position and usually is a junior lien of moderate strength

Stocks are classified on the basis of equity in surplus back of them as very high, high, large, good, moderate, fair, or small To quote again "In arriving at the basis for stock ratings the equity back of the issue is usually given the first consideration" As further explained this equity is composed partly of assets back of the stock and partly of known interest in surplus or profits It is thus plain that in the Moody system for the rating of both stocks and bonds, the asset element of security is regarded as of primary importance ²

A careful examination of the explanations given in the introduction to the different volumes of ratings leads to the conclusion that the income of a corporation is given even more consideration than assets In estimating the "security" of a bond or stock, in so far as the income is concerned, great emphasis is placed upon the factor of safety as explained in Chap. IX The period taken for the estimation of this factor is as long as possible; for railroads it is almost invariably 10 years; but for public utilities and industrials it ranges from 5 to 10 years Much emphasis is laid upon the period as a whole, discounting heavily the most recent results The factor of safety for each issue for

¹ MOODY, *Analyses of Investments Industrials*, 1923, p viii

² For the information in this paragraph compare Moody, *Analyses of Investments Public Utilities and Industrials*, 1919, p 18

each year is first calculated, but the final factor of safety used is obtained by a simple average of all the years for the period chosen. Where the interest or dividend requirement has varied during the period chosen, the amount at the most recent date is taken in all cases because this is of the most interest for the future.

While bonds and stocks are accorded very much the same treatment, they are considered as being fundamentally different, constituting two separate genres, as it were. We are told that, "The difference between a bond risk and a stock risk is a cardinal one."¹ No further explanation is given, however, as to why the two risks are fundamentally different. The net result gives ratings for the best stocks as high as for the best bonds. In view of the defective contract and essential weakness of all stocks as compared with bonds of the same corporation, it is difficult to understand how a stock can be placed in the same class with a bond of the same corporation from the point of view of risk.

Where the dividend rate is regular, the factor of safety is calculated for preferred and common stocks on the basis of income available for these issues taken together exactly the same as in the case of bonds. The equity in the accumulated surplus, however, is regarded as the most valuable index to the position of the stock. In the case of preferred stocks the equity in surplus is calculated on the basis of all surplus after deducting doubtful items in the balance sheet and adding hidden assets not taken account of above the face value of the preferred stock. For the common stock, the equity in surplus is calculated only after allowance has been made for the face value of the preferred stock. It is then the excess of surplus over the face value of the common stock which is considered. In case of both preferred and common stocks the "equity in surplus" represents both assets and income, as does the "security" with bonds.

Especially in the case of railroads, great weight is given to the "margin of safety," which is the proportion of the net earnings of a corporation remaining after fixed charges have been deducted. Fixed charges are composed of interest on funded debt, interest on floating debt, rentals, sinking funds, and interest and principal of car trust certificates. Thus if the fixed charges amount to 70 per cent of the net surplus, the margin of safety is 30 per cent. To quote from the volume on *Railroads* for 1919, "Nothing reflects the inherent stability of the great majority of American railroads at the present time so well as the margin of safety." This is calculated for each year of the period chosen for the general estimation of the financial record of the company. "In order to reach a fair basis of judgment, the records for each year are averaged and the average showing made is the basis on which the entire property is analyzed." Finally,

It must not be forgotten that arbitrary judgment is used to a large degree in making all these ratings. The percentages showing the factors of safety, and so

¹ MOODY, *Analyses of Investments Industrials*, 1923, p. vii

forth, serve as a general guide, but the rating given is, in many cases, affected by other considerations not shown in figures, such as character of management and of traffic, general position of the railroad system, policy of the company in maintenance and other expenses, and in other ways. The ratings are, therefore, to be looked upon as indicators of values, rather than as definite or final opinions.¹

Symbols.—The letters of the fore part of the alphabet are used as symbols for final ratings. *Aaa* denotes the highest rating accorded to both stocks and bonds (italicized for stocks), *Aa* the second highest, *A* third, *Baa* fourth, *Ba* next, while *B*, *Caa*, *Ca*, *C*, *Daa*, *Da*, and so forth, follow in turn. Whether in the case of railroads, public utilities, or industries, a particular symbol indicates identical quality. In the Key to Ratings for the volume on *Industrials* for 1923, the qualifications for *Aaa* bonds are stated as follows:

Bonds carrying an *Aaa* rating meet the highest test in asset value, earning power, and stability and while there is considerable variation in these qualities between one issue and another, all such issues fall into the general classification as the highest grade. Many such issues will have varying non-statistical characteristics, but such variations are usually superficial and unimportant and will seldom make an issue unavailable for this highest grade group if it measures up to the requirements of the "statistical rating."

Bonds and stocks of both *Aaa* and *Aa* rating "sell on a strictly income basis," being unaffected by special influences, and are classed as the "most conservative" investments. Issues rated *A* or *Baa* may be affected by "some development" but they have "distinct investment merit." Those rated *Ba* or *B* have an increased amount of "speculative risk" but are not entirely devoid of "investment characteristics." Issues rated *Caa* and lower are distinctively "speculative securities."²

Stocks.—Stocks are rated according to a statistical formula the same as bonds, but the formula is not the same. Stockholders are interested in dividends, rights, and growth of equities. Here the market value has nothing to do with the rating. The factors of earning power, dividend record, liquidity, permanent resources, and management are emphasized.

The symbol *Aaa* indicates a "stock investment" and was carried only by certain preferred stocks in 1931 which sold on a yield basis "comparable to that of high-grade bonds." They were "strongly entrenched in assets and share earnings." The rating *Aaa* is also reserved mostly for preferred stocks. The simple *A* rating is given to typical investment rails and "seasoned dividend payers" among other common stocks. *Baa* indicates the business man's investment, while *Caa* is given to new issues and to stocks of reorganized concerns. This symbol indicates stocks which make no progress.³

¹ MOODY, *Analyses of Investments. Steam Railroads*, 1919, p. 23.

² MOODY, *Analyses of Investments. Industrials*, 1931, p. vii.

³ *Ibid.*, pp. vii-viii.

The same symbols are used in rating government and municipal bonds as for corporation securities and have the same significance. Ratings are mostly confined to grade A or higher. They are based upon the general credit of the political divisions and upon the marketability of the bonds. On account of legal restrictions for municipal obligations, most municipal bonds are considered well written. Differences in ratings are largely the result of "the size of the city, its geographical location, the character of its manufactures, the average tax rate, and other facts of this nature." The bonds of the larger and more stable cities, or of cities of some size with rapidly growing population, are rated higher than those of smaller size and less rapidly growing population.

Estimate of System.—The mere review of Moody's system of rating brings out its many points of excellence. There is more or less adequate consideration given to at least three of the elements of investment credit, while the factor of management is probably taken account of in the non-statistical factors that modify the statistical rating. One could wish, however, for a more rigid separation of the different elements of credit and a more definite analysis of the special significance of each with reference to the different types of securities. Twenty-five years of successful rating speaks well for the system and indicates that it has justified the hopes of its authors.

It would seem, however, that the following points need more emphasis in a rating system:

1. A rating system should not rest too strongly on a statistical basis. Statistics necessarily refer only to past performances. Underlying economic factors of various description may completely alter the statistical showing for the future.

2. The method of the average of statistical results for a period of years does not show the very important matter of the trend or fluctuation of the business. As already pointed out in connection with the discussion of the factor of safety in Chap. IX, the average may be very deceptive, indicating either too rosy or too pessimistic prospects.

3. The moral element of risk should not be lightly treated. The importance of this element has already been sufficiently emphasized.

4. Stocks and bonds should not be separated into two coordinate classes, or, if separated, a rating system where risk is the chief thing to be rated would not accord any stock, no matter how good it may be, an equal position with a bond of the same corporation. Stocks are relatively defective in most of the elements of investment credit.

5. While priority of lien and foreclosure privilege are the most important parts of most investment contracts, other contractual provisions should receive due consideration.

6. Marketability has no connection with the intrinsic merit of a security. Although this is one of the qualities desired by many investors

for at least a part of their holdings, there are other qualities such as freedom from taxation, suitable denomination, and so forth, which are equally desired by investors. Marketability should, therefore, be omitted in rating where an effort is made to arrive at the intrinsic merit of an issue. Furthermore, a security may be marketable but only at a loss to the investor, whereupon the advantages of this feature are more apparent than real.

Poor's Rating Service—Poor's Publishing Company, the publisher of the well-known Poor and Moody Manuals, has within recent years established a rating service based upon the data contained in the manuals and such other information as is available. Thus far ratings appear to be confined to the securities of corporations and government bonds. The bonds of the United States are placed in a class by themselves and given the highest rating, from which all corporation securities are excluded, "on the theory that, from the viewpoint of American investors, if the United States Government is not safe nothing is safe." Corporation securities are grouped into classes below government securities according to their respective merits. No attempt is made to give a commercial rating to a company, but the intrinsic value of its securities alone is kept uppermost in mind. Ratings are relative rather than absolute, the attempt being made to rank the different issues in order to show their comparative merits rather than to estimate the degree of approach to absolute safety. While the main idea is to rate securities for safety, the degree of salability also affects the final result.

Securities, including both stocks and bonds, are divided into four general groups or classes with subdivisions within each class. The highest class is designated by the letter A. In this class come all securities within the legal requirements of investments for saving banks, trustees, and fiduciary agents. They constitute the general class usually designated as safe investments. In order to receive a rating within the A class, bonds must have ample asset security so that in case of forced liquidation the assets will be sufficient to cover the par value of the bonds. Earnings, except in the lower subdivisions of the class, are unquestionable in good and bad years alike, there is a possibility, however, in some of the issues given the lower ranking within this grade, that earnings may under exceptional circumstances reflect upon the price of the security. With this exception, the prices of all securities within this class are not affected by the credit of the company but are far removed from such influences, their prices being governed wholly by conditions existing in the investment and money markets. There are six subdivisions within Class A, which are indicated by means of asterisks following the letter; thus A*****, A****, A***, and so on. The highest class of corporation bonds is given the A***** rating.

The same symbols are used for stocks as for bonds, and apparently with the same significance. Stocks of the highest class reach only the

A** rating. They are "well-seasoned first-class preferred or common stocks, possessing equity in assets well in excess of par value; have long and favorable dividend record, and have demonstrated their ability to pass successfully through prolonged periods of depression" The equity in assets is safely in excess of the par value of the stocks of this grade, which also enjoy a large margin of safety in earnings The best guaranteed stocks are also given this rating Other stocks reaching the A class must be well seasoned and unaffected by depression, they must have a favorable dividend record and be firmly established, but in some cases their status might be subject to change The price of the stock is little affected, if at all, by the credit position of the company Market influences account mainly for changes in quoted prices of stocks of this group

The next grade of stocks and bonds is rated with the letter B, using again asterisks to indicate the subdivisions within the class of which there are only three for this group The bonds of the general group B are dependent for their value largely upon earnings. These may be large in the higher ratings of this group, but they possess some features of uncertainty The assets in liquidation may or may not be sufficient to cover the par value of the bonds, the final result being a matter of uncertainty Bonds of this group are influenced strongly by the trend of earnings and of certain financial ratios Their price is, therefore, subject to both the influence of market conditions and the current credit standing of the company Issues falling within this class are usually spoken of as "the business man's investment" and contain many bonds of the speculative class Very much the same can be said of the stocks of this class They have a fair equity in assets and a fairly good dividend record. Dividends on stocks of the two lower subdivisions of this group, B* and B, are a matter of conjecture, being protected only by a small margin of earnings, if any at all

Bonds and stocks of lower grade are assigned the letter C, also with three subdivisions They are unsatisfactory as to both assets and earnings, in many cases the earnings not being sufficient to cover interest requirements Many defaulted bonds are placed in this class Stocks which have paid dividends only to a limited extent or none at all, but with some prospects for the future, are also listed here Like the bonds of this group, the stocks are very speculative, depending on the uncertain fortunes of the corporation Stocks and bonds graded lower than C are usually hopeless Most bonds of this class have defaulted, and the stocks have little or no chance of permanent advancement They are rank speculations

In all cases, the salability of bonds and stocks affects the final rating Salability is also separately rated, all securities falling into one of four classes The principles of rating for salability are indicated by the following extract from Poor's Rating Service.

Rating "1"—Listed, with close and active market, the difference between bids and offers usually not over one point

Rating "2"—Listed, with wider market, or unlisted, with active market Bids and offers usually not over 3 points apart

Rating "3"—Listed, with bids and offers usually over 3 points apart; or unlisted, but with fair market

Rating "4"—Usually not so salable as those of groups 1, 2, and 3.

The factors which receive special attention and in some measure at least distinguish the Poor Rating Service from others are as follows

1 The point of view of the investor is taken throughout

2 Stocks and bonds are rated with the same symbols which designate identical degrees of safety This eliminates the distinction between a "stock risk" and a "bond risk" Risk, whether of stocks or bonds, is a matter of degree

3 The *trend* of a corporation's affairs is justly emphasized, for reasons already shown in connection with the discussion of the factor of safety The trend of important financial ratios receives especial attention

4 Recognition has been given to the influence of the value of the assets in liquidation

5 Emphasis upon the general reputation of the financial interests associated with an enterprise, together with its banking connections, is a partial recognition of the element of management in investment credit

6 The grouping of securities into the four distinctive classes will meet with the approval of the investing public

The Fitch Rating Service.—The Fitch rating service provides ratings for both bonds and stocks Like Poor's it recognizes no chasm between these two types of securities and allows the earnings record to dominate the primary stages of rating The earnings record is then modified by (1) the character of the industry, (2) position of the company in the industry, (3) state of competition, (4) monopolistic elements, (5) labor relations, (6) established market for products, (7) working-capital position, and (8) consistency of policy and permanence of successful control This service emphasizes the comparable basis of rating railroads, industrials, and public utilities It gives uniform treatment to such topics as depreciation, depletion, and grouping of bond interest and related charges

The outline shown on page 253 presents the classification of bonds and stocks used by the service

Stocks and bonds carrying the AAA symbol reach "maximum safety," while those marked the AA have standing "practically beyond question" Those marked A have "certain high-grade characteristics" but are subject to "possible adverse changes." Those carrying the symbol BBB have "moderate investment merit" and are likely to be relatively new but promising In grade BB the "investment element is not so pronounced," which designation applies with greater force to B issues

BONDS

Investment grades*

AAA Highest

AA High

A Sound

Semi-investment grades:

BBB Good

BB Fair

B Poor

Speculative grades*

CCC Good

CC Moderate

C Fair

Readjustment values

DDD Low

DD Small

D Slight or nil

STOCKS

Investment stocks whose dividends are conservative

AAA Safest

AA Safe

A Sound

Medium grade stocks usually paying dividends

BBB Good

BB Fair

B Uncertain

Lower grade stocks which are not paying dividends or are not justified in doing so

CCC Good dividend prospects

CC Fair prospects

C Slight prospects

Lowest-grade stocks with little or no value

DDD No dividend prospects

DD Slight apparent value

D No apparent value

Securities with markings below B are "increasingly hazardous and unpromising" or are of small value. The D issues represent securities of companies in liquidation or those being drastically reorganized.

Rating for Safety.—As the reader will probably have anticipated from the foregoing, the system of rating favored in this volume would be one whose basis rests squarely upon the intrinsic merit of the security itself. Stocks and bonds possess numerous features which are attractive to investors in different degrees, depending upon the immediate purpose in mind. On the other hand, no matter who the investor may be or what his purpose is, the matter of greatest concern to him is to be able to get a fair idea of the risk involved in every issue. The Simon-pure investor of a generation ago would doubtless choose securities with all the risk to capital and income eliminated. While investors today recognize, more than ever before, the essential uncertainty of all economic life, and of investments with it, and seek to avoid risk through diversification, yet intelligent diversification cannot be undertaken without first an appraisal of the risk involved in every stock or bond purchased. The speculator, likewise, would do far better if in addition to appraising the temporary or permanent prospects for increase in the price of his security, he would first seek to know the risk involved to his principal and income. It is too often forgotten that the chances for gain are frequently offset by equal or greater chances of loss. From whatever angle the matter is viewed, it appears that the prime essential in a rating system is the rating of inherent risk to the exclusion of all other qualities.

Rating for safety would exclude the influence of the investment and money markets. This may at first not seem to be justified, but it must be remembered that such influences are only indirectly connected with the

intrinsic merits of securities The purchaser of the soundest bonds in 1900, regardless of whether they were corporate, government, or municipal issues, indeed would have lost from 20 to 25 per cent or more of his principal had he sold out in 1920 But this would have come from no cause connected with the merit of the issues themselves Their prices declined on account of general economic and financial conditions to be explained in Part V. This is a subject in itself, the principles of which should constitute a part of the knowledge of every investor who undertakes to handle his own funds If it is desired to take into account in a rating system prospects of increase in price, assuming a given price for a security, it could easily be done by rating these prospects separately, while in no way interfering with a separate rating for safety It is sometimes claimed that the chances of gain are offset by the chances of loss, and, therefore, if the chances of gain are known, the chances of loss will also be known. No one conversant with the movements of security prices and their causes would claim this as an unqualified truth. As has already been emphasized in other places and is to be emphasized still more in Part V of this volume, risk in investment is as much due to general monetary and economic influences as to intrinsic merit Risks of the former class are indeed always present to a greater or less degree, but they have no relation to risks of the second class.

Rating for safety would take due account of the four primary elements of investment credit which are present in all investment issues and embrace the vital facts governing the risk factor The chief problem in this connection is the proper emphasis to be placed upon each element This will have to be decided on the basis of the kind of corporation or civil body which is the maker of the issue; it will be influenced materially by the nature of the contract itself, and the maturity date will have to have due consideration.

In general it may be said that management will receive emphasis in proportion to the opportunities offered for the exercise of this faculty It should receive most attention in rating government bonds where the contract is weak, and less attention in corporate issues with elaborate contracts which limit the legal activities of boards of directors and officers. Wherever little dependence can be placed upon the contract, management should receive greater emphasis, and the contract less On this principle, management will be of greatest importance in common stocks and least important in mortgage bonds. The asset element is of the greatest importance where the income element is essentially weak, or in case of issues of long or perpetual maturity, since earnings cannot be predicted for an indefinite time in the future Thus assets and income seem to have an importance in relation to each other, much in the same way as management and the contract, provided only the principle is not too rigidly applied The best rating would seem to call for a proper

weighting of each of the elements as the particular case in hand would dictate.

Importance of the Future.—Whatever system one may adopt for rating, whatever principles are to receive the most emphasis, probably the most important reservation one can hold is that the future is more important than the past. Investment is necessarily forward looking. Statistical ratings of income and assets are generally based upon past experience. Yet everyone knows the changeability of economic values and the moment new forces appear in the economic realm which will surely alter future values, past experience should be discounted in proportion. The rater will find it difficult to escape psychological presuppositions. Merely because a security has through years of successful experience become "seasoned" and a conservative clientele built up in its favor should not blind us to the possibility of change for the worse without notice. The rock-ribbed securities of yesterday in the textile, the coal, the sugar, railroad equipment, street-car, and other industries are today but the shadows of their former selves. Instead, on the horizon have appeared the securities of the electric light and power industry, the chemical, the automotive, the oil, the natural gas, and even the aviation industry. It requires a high order of ability in forecasting and a freedom from the dead hand of the past to properly appraise the securities of developing industries. Some of the soundest securities of today were mere gambles at the inception of their respective enterprises. When first presented to the public, the telegraph was pronounced by Congress to be a luxury unlikely ever to become of commercial importance. Likewise the telephone was turned down by the fraternity of investment bankers as merely a toy. It is precisely in the new industry that often the greatest safety lies. Mere past experience is nothing. It is important only in so far as no predictable changes for the future are visible on the horizon. But where visibility is low, danger lurks just beyond the vision of the eye. Open-mindedness to possibilities and probabilities are essential characteristics in estimating future values.

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PART III

THE FIELD OF INVESTMENT PRIVATE SECURITIES

CHAPTER XV

ECONOMICS OF RAILROAD TRANSPORTATION

Primitive Transport.—The need for transport is coeval with human life. Even in primitive existence it was necessary to transport the young and to bring water, firewood, berries, vegetables, and fallen game to places of human abode. And when the family or tribe took to the trail in its migration, the transportation of household effects was the absorbing problem.

Primitive solutions of the problem of transport of the young and of goods alike are found in the Eskimo hood, the Indian papoose frame, the Chinese yoke, the skin bag, the net, and the sling. But the cost of transport to the human "beast of burden" was immeasurably reduced with the domestication of the dog and the reindeer in the arctic regions, the horse in Japan, Europe, and America, the camel with its sensitive pads so well adapted to the desert regions, and the all but universal ox which has served man from time immemorial. As man's material accumulations increased, transport by draught was invented. The method of conveyance was by sledge in the colder regions and the V-shaped travois on the American plains, the wheeled transport being unknown to primitive America as it was to primitive life elsewhere.

Transport was greatly facilitated in regions where rivers and smaller streams, lakes, and ocean side abounded. The simplest of all water conveyance was the raft made of grass, reeds, or wood. Boats and canoes constructed of spruce and birch bark and dug-out logs of great length were used almost universally among primitive peoples.

Old World Transport.—Inland transport in ancient times was by means of the wheel cart and similar vehicles traveling along primitive trails which were broadened and smoothed to form the earliest roads. These were superseded in Roman times by the improved imperial highways of enduring construction by means of which the inland empire was cemented together. Over them Roman armies were easily moved to the border districts and commercial relations were maintained through the exchange of products of the various regions, as well as between the cities and country districts. The Mediterranean too was the scene of advancement in ocean craft. The rafts of primitive times were replaced by sail boats equipped with auxiliary banks of oars. On this inland sea they pursued their course, binding together three continents and making possible the colonial empire of old Rome. Sailing vessels in the ancient

world were employed as a part of the equipment of the merchant prince trading with distant ports and obscure regions, ascending shallow waters whenever occasion offered. These sailing vessels, minus the oar banks and enlarged in capacity to 50 tons, became the caravels of Columbus on his voyages into the unknown.

Modern Transport.—Modern transport may be said to have attained its first impetus in the seventeenth century through the efforts of Colbert who is credited with surfacing over 15,000 miles of road in France. Nevertheless, the industrial revolution in England looked to the markets of the outside world for its products. Factories centered on the navigable rivers or on the coast with easy access to the sea. Roads were indescribably poor. It required 14 days for the stage-coach to cover the distance from London to Edinburgh. Inland trade was dormant and "money of the richest districts of the kingdom remained unproductive, awaiting the tardy advance of the art of transport."¹ Toward the close of the eighteenth century Telford and MacAdam, both Scotsmen, first introduced scientific road-making in Great Britain and laid the foundation for inland trade.

The distinct contribution of the period prior to the nineteenth century, however, was the construction of canals, first begun in Holland, a land of suitable topography and natural waterways which only needed connecting by artificial means. In France canals rose to a national system of transport. Britain followed the example of her continental neighbors and by 1830 could boast of 3,000 miles of canals. Thus by means of the construction of roads and canals England provided a market for her factory-made goods at home and abroad which placed her at the head of nations in commercial prowess.

Early Transportation in America.—During the two centuries of American colonial life, transportation facilities showed little, if any, real improvement. In the country districts, roads were too often mere Indian trails, while the approaches to the largest cities were only "mud roads" which were practically impassable in wet weather, while in dry weather ruts were deep and descents precipitous, making travel dangerous at all times. After the fashion of England in earlier times, road administration was in the hands of local authorities as indeed travel for the most part was itself local in character. There were no bridges over the great rivers and smaller streams were crossed at infrequent intervals over loose planks, while felled timber crossways spanned the deepest mud holes. Similarly methods of transportation were crude. The mud-boat or stone sledge was in common use on farms, while two-wheeled carts and wagons were to be found in the more progressive communities. The stage-coaches, mere boxes swung on wheels supported by leather straps, were the only

¹ D. LARDNER, *Railway Economy*, p. 35.—HENRY D. TRAILL, *Social England*, Chap. 5.

means of public conveyance. Transport on horseback was still the most reliable and the speediest. The United States had no system of transportation, except on national waterways. On the most frequented route of travel, it took a week to make the journey from Boston to New York and three weeks to Charleston, while mail service was only tri-weekly. Long-distance freight traffic was non-existent.¹

The spirit of localism prevailed in the American colonies until after the Revolution. With the achievement of political independence and unity the necessity of easy inland transportation, travel, and communication became clear. The commercial interests of the seaboard cities joined hands with the scattered agricultural interests of the interior in working out a system of transportation which was a necessity for the interchange of their products.

The Revolution turned the face of America toward the West. There lay unmeasured stretches of wilderness reaching to the Mississippi which Thomas Jefferson said it would take a thousand years to populate. The economic slump following the Revolution drove the people of the seaboard regions toward this new and fertile domain. The land ordinance of 1787 created the Northwest Territory and opened the way for the famous land companies of the Ohio with their colonization program. Already in the latter part of 1787 could be seen hundreds of boats floating down the Ohio River bearing new settlers. Once under way, this westward movement of the population became the dominant factor of American history as long as new lands could be found. It became the great speculation throughout the nineteenth century.

Districts located along the seaboard and navigable streams could get their products to market by means of floating rafts, flatboats, arks, and ships. But a few miles inland there were only Indian trails and primitive wagon roads. It cost \$5 (equal to the price itself) to haul a barrel of flour 150 miles, the cost of salt 300 miles inland was 6 cents a pound, 5 cents of which was due to transportation charges. The movement of bulky commodities was thus prohibitory over long distances. The distillers of whiskey less than a hundred miles out of Philadelphia were merely solving the problem of transporting grain. They were "distillers through necessity," as Gallatin expressed it.

The state governments themselves took up the problem of transportation. The impelling motives which lay back of this early movement are well expressed in the preamble of one of the acts of the Pennsylvania legislature as follows: "The opening of roads through the unsettled part of this state will greatly promote its settlement and population, and

¹ Brief accounts of early American transportation are found in J. B. McMaster, *History of the People of the United States*, Vol. I, pp. 52, 54, 67, 68, and in F. A. Cleveland and F. W. Powell, *Railroad Promotion and Capitalization in the United States*, Chap. I.

increase its domestic and foreign commerce, its manufactures and agriculture "

The outbreak of the European wars of 1793 greatly increased the demand for breadstuffs of all kinds, doubling the price of grain in the United States and accentuating the movement of the population to the rich agricultural lands of the interior. But for the more remote regions even to the east of the Alleghanies the cost of transportation was still prohibitive. In the South an economic revolution was being wrought. The invention of the cotton gin in 1795 and the war demand for American cotton turned that section from tobacco raising to cotton.¹ The transportation problem became acute with the Embargo Act of 1807 which closed all American ports to foreign commerce for the following 7 years. The vast shipping interests of New England built up with the outbreak of the European wars were thus dealt their death blow. Through transportation became a national political issue. In the same year that the embargo was laid, Congress instructed Gallatin, secretary of the treasury, to investigate transportation conditions. The result was his report of 1808, recommending a vast system of turnpikes and canals connecting all sections of the country at an estimated cost of \$20,000,000. It was out of this that the National Pike came as the net result of federal aid to transportation.

The Turnpike.—The turnpike was the first solution offered to the problem of long-distance transportation between inland points. Its construction, usually macadam, was superior to that of local roads and in almost every instance represented an investment of private capital often raised by public subscription. The first turnpike of any consequence was built from Alexandria, Va., to the Lower Shenandoah and was begun in 1785-1786. The first really significant work, however, was the turnpike connecting Philadelphia and Lancaster, a distance of 62 miles, and completed in 1794 at a cost of \$465,000. Its success was instantaneous and immediately the movement spread rapidly to the other states. By 1804 the road was extended to Pittsburgh and the stage-coach made regular weekly trips. By 1825 Pennsylvania had constructed 2,200 miles, and New York 1,500 miles by 1811. By the end of the War of 1812, some eight hundred companies had been chartered for this purpose. In addition many toll-bridge companies were also chartered for spanning streams. The states encouraged private companies in every way, in several cases subscribing to their capital stock. But "at best this movement did but little to supply the great need for improved transportation."² Bulky

¹ The revolution wrought in the South is revealed by export statistics of cotton which increased from 138,328 pounds in 1792, to 63,944,459 pounds in 1807 —PITKIN, p. 111.

² F. A. CLEVELAND and F. W. POWELL, *Railroad Promotion and Capitalization in the United States*, p. 39.

products were still moved only with great difficulty if at all and only by paying high toll charges. The turnpike did provide comfortable transportation for passengers even though time and expense were little reduced over former conditions

Nevertheless, the advantages of the turnpike, particularly for passenger transportation, led to a demand for federal aid. The one great accomplishment from this movement was the construction of the Cumberland Road or National Pike. This was begun in 1811 with the eastern terminus at Cumberland, Md., extending westward to the Ohio and finally in 1838 reaching Vandalia, Ill. The cost was \$6,821,200. This turnpike was in every way superior to most of those built by private capital, it reduced the time between Baltimore and Wheeling from 8 to 3 days while the cost of freight was halved.¹ The development of the traffic was instantaneous and this road at once assumed the position of the most important highway to the West. It was the great thoroughfare for the stream of population with its effects pouring across the mountains to the Ohio Valley. On it also were to be observed merchandise freights from the East and livestock moving to eastern markets.²

The Steamboat.—But the people of the Ohio Valley looked to the Southwest for a market for their bulky products. The farmers built barges or flat-bottom boats, loaded them with their products and floated them down the Ohio and Mississippi Rivers to New Orleans. After disposing of the cargo, the boats were abandoned and the return trip made by foot or horseback through hostile Indian countries. The trip required months and was accompanied with many hardships and dangers which only the pioneer with the will to succeed could face. Neither this nor the turnpike promised much in the solution of the long-distance transportation problem.

Greater hopes came from the development of the steamboat. The first practical boat, the *Clermont*, was constructed by Robert Fulton in which was installed an English-made engine, and it made its first trip up the Hudson to Albany in 1807. It demonstrated the feasibility of upstream navigation for the first time in history. By 1813 there were six steamboats on the Hudson, doing a flourishing business between New York and Albany. In 1811 the steamboat was introduced on the Ohio but only seven more were built before 1816 when the *Enterprise* made the trip from New Orleans to Louisville in 25 days.³ Monopolies of naviga-

¹ E. L. Bogart, *Economic History of the American People*, p. 324.

² Thomas B. Searight, in his work *The Old Pike* (p. 16), draws a pen picture of the old road thus: "As many as twenty-four horse-coaches have been counted in line at one time on the road, and large, broad-wheeled wagons, covered with white canvas stretched over bows, laden with merchandise and drawn by six Conestoga horses, were visible all the day long at every point, and many times until late in the evening, besides innumerable caravans of horses, mules, cattle, hogs and sheep."

³ Bogart, *op cit*, p. 329.

tion were granted to Fulton and Livingston, the owners of the two boats, by New York for the Hudson and by Louisiana for the lower Mississippi. These unfortunate grants retarded navigation on these streams until the Supreme Court of New York overturned the privilege in 1824. This threw inland waterways open to free navigation. By 1829 there were 200 boats on the western rivers, and by 1842 there were over 450. Already by 1823 the time from New Orleans to Louisville had been reduced to 15 days.

The Canal.—All efforts for improvement in transportation thus far left unsolved the problem of connecting the commercial East and the agricultural West, as well as the problem of cementing these regions in political union. On the contrary, western trade with New Orleans and the South was reaching large proportions and the future trade of the West appeared to be lost forever to the commercial ports of the East. Economic, and even political, isolation of the West from the East seemed inevitable. In this dilemma the people turned to canals. But here the way was blocked as far as private investment of capital was concerned. The amount required to build canals across the mountains, and the engineering difficulties in the way, seemed to make the projects insurmountable. Investors were loath to sink money into projects which required many years to complete and even then promised little in the way of return on the investment.¹

Finally with all hope for national aid abandoned, in 1817 New York undertook the construction of the Erie Canal out of public funds. It was finished in 1825 at a cost of \$8,801,394 which was more than recouped out of the tolls during the following 9 years. The canal was an instantaneous success. Wherever it joined streams, large cities quickly sprang up, while New York supplanted Philadelphia as the leading port in the United States. The cost of transporting freight between Buffalo and New York City fell from \$100 to \$5 a ton and the time required from 20 to 6 days. This recaptured the freight that had gone down the Susquehanna to Baltimore and down the Delaware to Philadelphia. In addition to this, freight that had previously gone down the Ohio to New Orleans was now diverted to New York at substantial reduction in rates. Between Ohio and the seaboard, freight rates were soon down to one-tenth of their former figure. The price of corn, wheat, and flour at Cincinnati was doubled and trebled, while the price of manufactured goods sent via the canal was substantially reduced. Never before in our history had a transportation route so completely justified itself. It meant prosperity to the western farmer and to the eastern manufacturer alike who now had a practical means of transporting and interchanging their respective products with each other.² Even before this, the states

¹ Exceptions to this were the Middlesex and Montague Canals in Massachusetts and the Delaware and Schuylkill Canal in Pennsylvania.

² BOGART, *op cit.*, pp. 332-333.

of Pennsylvania, Massachusetts, and Maryland took measures looking toward constructing similar canals. Pennsylvania actually completed at a cost of \$10,000,000 a canal and portage system from Philadelphia to Pittsburgh which operated without the transfer of cargo at portage points. A commission appointed in Massachusetts reported favorably in 1826 on a canal connecting Boston with the Hudson.

After the success of the Erie Canal great stimulation was given to connecting the Great Lakes with the Ohio and Mississippi Rivers. This would establish commercial connection with New Orleans. Ohio constructed two major canals, the Ohio Canal, connecting Cleveland and Portsmouth, completed in 1832, and the Miami Canal, connecting Toledo and Cincinnati, completed in 1845. The latter opened up the wilderness of the northwestern part of the state to the development of agriculture, forests, and minerals. The same price revolution took place in these newer regions that was noticed as a result of the opening of the Erie Canal. Indiana completed the Wabash and Erie Canal and White Water Canal in 1843. Illinois built the Illinois and Michigan Canal during the years 1836-1851. Altogether, to 1838, as many as 18 states had incurred indebtedness of over \$60,000,000 for canals, which testifies to the public importance of the new means of transportation.

Early Railroads in England.—The history of railroads properly begins with the tramway. This was in use in England before 1671. The best account of these early tramways relates to the one at Newcastle-on-Tyne which was built from the coal mines to the river. It consisted of two rails constructed of timbers laid parallel to each other, upon these heavy carts could be drawn by horsepower. Later the timbers were pegged to cross ties with strips of replaceable hard wood over the surface. In time these were replaced by flat strips of durable wrought iron. But already in 1767 solid rails of cast iron replaced the wood and iron combination; at first these were flat but afterwards flanged on the outer or inner edge to guide the cars. Long wrought-iron rails stronger than cast iron were later added. In 1815 the flange was transferred to the wheels. The early tramway started with the single car and was later replaced by trains of cars, thus distributing the load, lessening the wear on the rails, and increasing the efficiency of the tractive power.¹

Real progress in transportation came with the application of steam as motive power. The world is indebted to Stephenson for the accomplishment of this against engineering and public prejudice of the day.² Through his efforts the Rainhill prize of £500 was offered in 1825 for the

¹ CLEVELAND and POWELL, *op cit*, Chaps. III and IV.

² Stephenson's first experiments with crude locomotives on the Stockton and Darlington (organized in 1821 and opened for traffic in 1825) were inconclusive and turned prejudice against the steam locomotive.

most successful locomotive Stephenson's new creation, the *Rocket*, won and it was immediately put into service on the Liverpool and Manchester railway This marked the turning point in favor of the steam locomotive

The Railroad in America.—In America, as in England, the tramway preceded the railroad The earliest one was on Beacon Hill constructed in 1807 But the Baltimore and Ohio holds the honor of being the first railroad in the United States. It was chartered in 1827, begun in the following year, and 13 miles were opened for traffic in 1830¹ It used horsepower converted into mechanical power by means of a tread apparatus and made the first trip carrying passengers in 1 hour and 15 minutes The company experimented for many months with sails as a means of propulsion. But this was terminated and horsepower abandoned in 1831 with the introduction of Peter Cooper's locomotive, the *Tom Thumb*²

It was not an accident that the first railroad in America was built out of Baltimore to the West New York and Pennsylvania had built canals to their western borders; but this method of transportation was not open to Maryland whose topography was unsuited for canal construction The railroad came as the solution of the transportation problem where irregular topography prevailed Massachusetts was in a position similar to that of Maryland After fruitless effort with charter granting, finally in 1831 the Boston and Worcester was chartered and in 1833 the Western was to continue construction to Albany

But with the exception of the examples just cited, the lines begun in this early period were designed for local purposes and mostly to connect or supplement navigable waterways For instance, the Mohawk and Hudson, the progenitor of the New York Central, was designed to connect Albany with the Erie Canal at Schenectady Competition between canals and railroads first entered with the building of the Boston and Lowell and the consequent diversion of traffic from the Middlesex Canal Later the Reading railroad entered into competition with the Schuylkill Canal in carriage of coal and the New York Central with the Erie Canal in the carriage of flour

The early conception of a railroad was simply an improved wagon road Early charters authorized the construction of a "turnpike or

¹ On the Fourth of July, 1828, Charles Carroll, the only survivor among the signers of the Declaration of Independence, laid the first rail on this system As Hadley remarks, "One man's life thus formed the connecting link between the political revolution of the last century and the industrial revolution of the present"—See A. T. HADLEY, *Railroad Transportation*, p. 1

² The first steam locomotive in America was run on the Carbondale and Honesdale railway in 1829 and was built in England But English locomotives were too heavy for the light tracks and heavy grades of American railroads The first American locomotive used on a railway was used on the Charleston and Hamburg in 1830, which was the first road definitely to displace horsepower—W. H. BROWN, *History of the First Locomotive in America*, pp. 75-76, 83-92, 147

railroad " Railroads were to be public roads operated like turnpikes with the collection of tolls But from the first, traffic exceeded all expectations and costs of construction increased as the newer conception of the railroad dawned upon the country Thus new traffic was created wherever the railroad went, communities and regions developed, and the costly experiments of early railroading did not prove financially disastrous. Railroads had to overcome the opposition of vested interests in turnpikes, bridge and coach companies, and tavern keepers Where they competed with canals, freight traffic was often prohibited by law or only upon payment of tolls on parallel canals. Nevertheless, the competition of the railroad was fast replacing the earlier methods of transportation

Even the Baltimore and Ohio had its western terminus at Cumberland to connect with the national pike, while the Erie stopped at the Allegheny River. Transportation to Chicago from Detroit was by rail to Lake Michigan and thence by steamboat across the lake Likewise, Ohio had railroads connecting Lake Erie with points along her canals. But evidence was growing that the railroads of the future would be for long-distance transportation In the South, Charleston and Savannah were connected by rail with Atlanta and Chattanooga Along the Atlantic Coast, soon continuous passage by rail might be had from Maine to North Carolina. Boston was connected with Ogdensburg and Buffalo in 1843

The early local railroads were built as community enterprises, fostered by those interested in city real estate and farm lands Profits were to come from increase in land values rather than from the earnings of the roads themselves It was, therefore, difficult to obtain capital in large amounts But the success of the New England roads, with their large dividends, the mounting traffic everywhere, and encouragement of legislative assemblies, soon gave the assurance required to attract capital Frenzied railroad building became universal, railroad securities entered the speculative list and soon dominated all other types of issues—a situation which held down until the World War Several states began construction of railroads, while most states contributed money or credit to private corporations. Foreign investors were drawn into the general mania of the eighteen-thirties and contributed large sums to internal improvements in general before the panic of 1837.¹

Before 1840 roads had been built from Boston to Lowell, Worcester, and Providence, while New Haven and Hartford were connected, as was Schenectady with Albany and Saratoga. In 1834 the Pennsylvania state

¹ In 1835 Chevalier wrote "Everybody is speculating, and everything has become an object of speculation The principal objects of speculation are . cotton, land, city and town lots, banks, railroads Speculations in railroads have hardly been less wild than those in land. The American has a perfect passion for railroads" —*Society, Manners, and Politics*, pp 305-307

system reached Pittsburgh, the Baltimore and Ohio reached Harpers Ferry in the same year, and in 1835, Washington, while 1838 saw Philadelphia, Wilmington, and Baltimore connected. New York was connected with Washington in 1839 by the completion of the Camden and Amboy. In 1833 the Charleston and Hamburg, with its 136 miles of road, was put in operation and was the longest railroad in the world. New Orleans was connected with Lake Pontchartrain and Lexington with Frankfort. So great was the momentum of railroad construction that the panic of 1837 made no impression upon its progress.

Railroads versus Canals—At best, through transportation by rail was very difficult and expensive at the middle of the nineteenth century. The individual roads were only a few miles in length and each, proceeding independently, had adopted varying gauges, making it necessary to reload cars at transfer points. In 1843 Boston had through rail connections via Albany to Buffalo and the lake regions. But it was not until the widespread adoption of the standard gauge of 4 feet 8½ inches in the fifties that through transportation by rail became an actuality. In 1851 the New York and Erie gave New York City the trade of the southern counties of New York State. The Pennsylvania opened a through route in 1854. New York and Chicago had through service in 1853 which was extended in the following year to the Mississippi River and in 1855 to St. Louis. St. Joseph on the Missouri River was reached in 1858.

By 1860 it was evident that the railroad was to share with the canal the field of through transportation. It had the clear advantage of quicker movement of freight and passengers and direct and continuous service during the winter months when waterways were frozen and service suspended. No doubt also, in many instances and for many purposes, railroad costs were less than water. Even by 1850 passenger fares from Chicago to New York via lake and rail were reduced from \$74.50 of a decade earlier to \$17, while wheat was transported between these points through rail facilities at 27 cents per bushel and flour at 80 cents per barrel. Improved service and decreased costs made it possible to transport breadstuffs and produce from the Chicago territory to the eastern seaboard and opened up the export trade in these same commodities. Railroads created the so-called "home market" for agricultural and mineral products, while in the East textile mills, shoe factories, hardware plants, blast furnaces, and steel mills received their first real impetus. However, railroad traffic did not surpass canal traffic between the East and West until after the Civil War. In 1860 the combined tonnage of the Baltimore and Ohio, the Erie, the New York Central, and the Pennsylvania railroads was exceeded by that of the Erie Canal.¹

Gridironing the Country.—The momentum that railroad construction gained in the decade following 1850 gathered force during the following 30

¹ BOGART, *op cit*, p. 360.

years. Once the superiority of railroads was demonstrated and their feasibility in the face of all sorts of topographical conditions proved, no further restraints were observed. Railway mileage grew from 30,626 in 1860 to 176,461 in 1893.

The Homestead Act of 1862 and the disbanding of the soldiers after the Civil War were followed by the movement of population from the districts of the East into the territory west of the Missouri River, to the Northwest, the Southwest and the Pacific Coast. To this westward movement of the native population was added the swelling tide of immigration from Europe in numbers hitherto unknown. The railroads became the carriers of these people in their search for new homes and opportunities. Their products found markets over these same roads in the more densely settled manufacturing and commercial centers to the East, as well in European markets, while the manufactured articles of the East found ready markets among the agricultural population of these newer regions.

It was during these years that the great transcontinental railroads of today were built. The Union Pacific and Central Pacific established rail connection between Omaha and San Francisco in 1869. In 1881 the Atchison had completed its connection with the Southern Pacific to the Coast, a few years afterwards it entered California via Needles and Barstow, and by 1899 had established through connections with San Francisco. The Northern Pacific completed construction of its line from St. Paul to the Northwest coast in 1883, and in the following year the Oregon Short Line was completed, giving connection at Ogden with the Union Pacific and the Denver and Rio Grande which had been completed the year preceding. In 1893 the Great Northern reached Seattle. While these systems represent the completion of the efforts to establish through connections between the Atlantic to the Pacific Coast, several competing roads were afterwards built, namely, the San Pedro, Los Angeles, and Salt Lake completed in 1905, the Chicago, Milwaukee, and St. Paul in 1909, and the Western Pacific in 1911. In general, the transcontinental lines followed the population rather than preceded it. Nevertheless, increased facilities for travel and transportation vastly hastened the migration of people to the western regions and repeated again on a grand scale the same process of establishing commercial and economic connections between the East and the West. It determined for the critical period of settlement the movement of the population on an east-and-west course regardless of mountains, deserts, and other physical barriers.

The federal government lent its aid to railroad construction by huge land grants and subscriptions to bond issues. In 1862 the Union Pacific Railroad was given about 12,000,000 acres of land in alternate sections on either side of the road between Omaha and Ogden, while to the Central Pacific from Ogden to Sacramento it gave about 10,000,000 acres. In

addition the government lent its credit on second-mortgage bonds to these roads to the extent of \$27,000,000. Other roads receiving grants were the Northern Pacific (10,000,000 acres), Atchison, Topeka and Santa Fe (\$6,400 per mile), the Southern Pacific, and Texas and Pacific. During the period of government grants from 1850 to 1871, some 214,000,000 acres were bestowed upon the trunk-line railroads, although much of this was never transferred, owing to the failure of the railroads to meet stipulated conditions.

In the meantime, while the long routes were being established, feverish railroad building for local purposes took place in one section after another as settlement pushed out into newer regions. Prior to the panic of 1873 it was the upper Mississippi Valley that was the scene of most active construction. A decade later it was the Southwest and Rocky Mountain regions. With the panic of 1893 the railroad fever began to subside. But the main transcontinental routes were completed and the semi-arid regions to the west and southwest of the Missouri River had been grid-ironed with a network of rails, while on the Pacific Coast branch lines had followed the main valleys and regions as they stand today. By 1916 the maximum mileage of 259,705 was reached, the highest point in our history. This period saw the completion of branch and local lines to points which were overlooked in the intenser period of building which preceded.

Railroad Equipment.—In contrast with European systems, American railroads have always been characterized by heavy, bulky tonnage and long distances. Over 75 per cent of the tonnage has consisted of coal, iron, lumber, grain, livestock, and similar commodities. This has necessitated heavier rails, stronger bridges, and more durable and capacious equipment and, with it, cheap rates. No sooner had the old wooden rails with iron strips been replaced by iron rails (about 1860) than the steel rail began to replace the latter. Iron rails weighed but 36 pounds per yard, while steel rails were much heavier.¹ With stronger rails and improved roadbeds, heavier locomotives with greater tractive power gradually replaced the lighter ones. Locomotives of today reach a weight as high as 760,000 pounds. Following these improvements came larger, stronger, and more capacious steel freight and passenger cars. Improved terminal facilities included electric cranes and elevators which reduced loading expenses.

Rates.—Railroad rates declined rapidly with the technical improvement in transportation, aided by competition among the through routes

¹ The increasing weight of the steel rail is an index to the progress of efficient transportation in the United States. Modern rails are now seldom under 100 pounds per yard and many run as high as 130. In 1870 the capacity of the average freight box car did not exceed 24,000 pounds, by 1900 steel cars with 100,000 pounds capacity were common.

and of the waterways. The average rates on wheat from Chicago to New York are shown in the following table.

TABLE 27—AVERAGE ANNUAL RATES ON WHEAT FROM CHICAGO TO NEW YORK¹
(Average cents per bushel)

Year	By lake and canal	By lake and rail	By all rail
1868	22 8	29 0	42 6
1880	12 3	15 7	19 9
1890	5 8	8 5	14 3
1900	4 4	5 1	9 9
1910	5 1	6 6	9 6
1920	14 7	15 3	16 7
1927	7 2	11 1	18 0

¹ BOGART, *op cit*, p. 641

In 1867 the average freight rate per ton-mile on all the tonnage was \$1.93 (gold prices), in 1882 it was \$1.24, and in 1900 only \$0.73. Reduction in rates upset eastern agricultural regions which were replaced in cereal production by the central and northwestern states, while canals suffered a permanent relapse in traffic in favor of the railroads, in spite of the fact that transportation by canal or water was cheaper. Even in 1873 railroads got only about 30 per cent of the bulky freight of the country, but by 1900 they had 95 per cent of all eastbound freight.¹ Boston, Philadelphia, and Baltimore began a new era of development, especially in export trade, following the favorable differential freight rates of 1876. In a somewhat similar way, travel by rail has been much enhanced by the introduction of sleeping, dining, and parlor cars and more comfortable accommodations in every way, although reductions in passenger rates have been more modest than those of freight.

Consolidations—Consolidation of railroads began in the decade 1850–1860 with the linking together, end to end, of the independent local roads in order to establish through lines. Consolidations appeared in all sections of the country and by 1873 there were at least 69 end-to-end consolidations of more than 200 miles in length, the Erie with 959 miles being the longest.² Consolidations were often furthered by the necessity of transshipment of freight at terminal points when the gauge of the roads differed. Although the present standard gauge won its way to a dominant position before the Civil War, it was not until about 1886 that it was adopted on the leading railroads.

The competition between railroads grew intense as the consolidations were completed. The race for traffic began in earnest in 1869 when the New York Central and Pennsylvania railroads each secured through

¹ BOGART, *op cit*, p. 641

² A. S. DEWING, *Financial Policy of Corporations*, p. 739

connections with Chicago, to be followed soon by the Erie and Baltimore and Ohio. Ruinous rate wars followed. In the rate war of 1876, first-class westbound rates dropped to 15 cents per hundred pounds from \$1.88 a few years before. Passenger fares went as low as \$7, while there are records of cattle cars being transported this distance for \$1 each. Intense competition brought consolidations of competing lines into great railroad systems. One example of this is the Pennsylvania system west of Pittsburgh. So general was the movement that by 1893 there were 35 systems with mileage in excess of 1,000 miles each (the Atchison, Topeka, and Santa Fe had over 9,000 miles), whereas 20 years before no road could boast as much as 1,200 miles.¹ After the panic of 1893, and down to 1907, came the greatest period of consolidation. This was the period when "systems of systems" were created.² The dominant motive of financial control has been assigned as the chief force in these consolidations. Yet few today would doubt the fundamental economic advantages of better service and reduced cost occasioned by these consolidations.

Railroads and Progress.—As an economic force, railroad transportation has made possible the modern systems of mass production and exchange, the functional and territorial division of labor, the growth of cities, and the development of the natural resources of the country. As one writer puts it,

The railroads proceed along straight or curved lines, can cross rivers and climb mountains, and can reach all the important cities and towns with a direct service, anywhere. They possess speed, permanence, adaptability, and are susceptible of increase sufficient to meet all the greater needs of an advancing, increasing population. They have spanned the continent, gridironed the states into closer union, joined two oceans in commerce, delivered the people to all points of the compass, carried products and raw materials wherever desired, and have been the chief factor in the material development of our civilization.³

Passenger transportation has made possible the more personal association of people with the greater solidarity of interest which it creates. Railroads have welded the people of all sections together and made possible the political unity of a country possessing over 3,026,000 square miles of territory.

Present Status.—Railroad mileage reached its maximum just before the war and has steadily declined since that time. New construction has fallen to insignificant figures, while abandonments are steadily on the increase. The present railroad plant consists of about 250,000 miles of road. Passenger traffic reached its maximum in 1920. Since this time a loss of over one-third has been sustained without any indication of a

¹ DEWING, *op. cit.*, p. 749.

² W. Z. Ripley speaks of the process as "the higher strategy in railroad consolidation."—*Railroads, Finance and Organization*, p. 459.

³ *Commercial and Financial Chronicle*, Jan. 17, 1931, p. 368.

change for the better. Following an annual increase in revenue tons carried 1 mile from 1901 to 1926, there was an actual decrease in the following years of prosperity.

Automotive Competition.—Although the passenger automobile is only about 30 years old, while the truck, the bus, and coach are still younger, the capital invested in this industry and in highways, as well as the number of employees and annual value of their product, exceeds that of the railroads. Although the passenger automobile has created much of its own traffic which railroads never would have created, nevertheless its development along with the bus and coach has made alarming inroads into railroad passenger traffic for the shorter distances (except commutation traffic) and has even checked the growth of long-distance traffic. The motor truck has operated more successfully in territory of restricted radius, under present conditions the limit of profitability being 50 to 100 miles. Trucking has assumed two forms, namely, public contract lines and private lines operated exclusively as auxiliary to business establishments.

Motor-truck traffic outside cities is probably between 3 and 4 per cent of the amount hauled by railroads and only 8 per cent of this is of the common carrier class, an amount not large enough to constitute a threat to the latter.¹ Most of this is of local nature with quick pick-up and store-door delivery of light merchandise, which can well be dispensed with by the railroads since hauls up to 50 miles, the typical truck haul, are accompanied by great expense in handling by the railroad. The perishable fruit and vegetable business around New York is mostly done by truck, while 40 per cent of the eggs, milk, and other farm products is thus hauled into the metropolis. Thus the failure of railroad traffic to increase since 1926 may be largely a reflection of the trend in the traffic for the shortest haul, which when completed will allow the normal per capita increase in freight in future years.

Greatest success appears to have been attained in motor trucking by the carrier truck in the delivery of passenger automobiles to their points of destination from factory or assembly plant. These are frequently of the double-deck variety and haul eight or more automobiles each. With the present low price of gasoline, their radius seems to be about 500 miles when they meet competition in rates by rail. This leaves few of the lower-priced automobiles to be delivered by rail, since assembly plants are scattered far and wide. Already in 1929, something like 45 per cent of all new cars were delivered by carrier trucks or under their own power. The extent of the transfer of automobiles by boat is also substantial and gaining rapidly. Altogether, rail transfer

¹ Notable exceptions must be made to this. In California, freight trucks hauled about fifteen times as much as the railroads of the state. Many metropolitan districts of the Pacific Coast elsewhere are served mostly by truck.

of cars is rapidly waning. The chief handicap of the truck thus far has been the failure to acquire a return load which, if secured, would make the trip more profitable and increase the severity of truck competition. On the other side of the picture is the upward trend in gas taxes, the possible increase in the price of gasoline, and the potential public regulation of the truck. Drastic laws limiting the operation of trucks have already been passed in Texas, Virginia, West Virginia, and Kansas. Nor is it known at present whether current rates on freight yield a profit to the motor companies. Lastly, it should be mentioned that both the bus and truck are receiving effective competition from lines operated at a satisfactory profit by the railroads themselves as auxiliary to their own traffic. More than 35,000 miles of bus lines were thus operated in 1931. Under present conditions the competition of motor trucks is essentially unfair to railroads. They operate on highways improperly constructed for heavy freight traffic and paid for out of public funds to which railroads contribute an even larger share in taxes. Public regulation of motor trucks must furnish the corrective here. This measure is strongly recommended by the Interstate Commerce Commission.

Waterways—Railroad transportation is again threatened by water, its old rival which was displaced more than 50 years ago. Water transportation now as formerly bids for bulky freight and for long-distance hauls. Except on the Great Lakes where conditions favor water transportation for ores and fuels, this form of transportation was long ago discarded as uneconomical. Nevertheless, water transportation within recent years has taken on new life in the Middle West. This is due largely to the low-cost coast-to-coast freight service through the Panama Canal, the loss of transcontinent rail hauls for bulky commodities, and the consequent threat to middle-western industry through the unfavorable freight differential in favor of eastern industry. Inasmuch as the traffic through the Panama Canal is paying for all operating expenses and a return of about 3 per cent on the investment besides, it appears that rail hauls may be too long as well as too short to be profitable. Panama Canal tonnage moves at a far less rate than transcontinental rail rates. Even traffic of the Middle West moves by water to the South and eastern seaboard and thence through the Canal to the Pacific Coast at lower rates than by direct rail route to the same points. Similar competition of water is found in transshipments from New York via the barge canal to lake ports. Sentiment at the present time appears to favor the improvement of the Saint Lawrence and the inland waterways of the Middle West and South. Already the Inland Waterways Corporation chartered by the federal government for the operation of barges on the Mississippi and Ohio Rivers is hauling freight to the South and to intermediate points at large operating deficits, if maintenance of the water courses be called an operating expense, to say nothing of loss of interest

on capital invested in barges and exemption from taxes. Government-supported water-ways, if sufficiently developed out of taxation and thrown open to public use without charge, may eventually constitute a real menace to railroad traffic.

Other Forms of Rail Competition.—Still other sources of loss of tonnage have made their appearance. First may be mentioned pipe lines for the transportation of petroleum and its products. They have already withdrawn large amounts of traffic from railroads. To the large losses from petroleum pipe lines is now added the increasing transportation of gasoline by the same method. While such economical competition is fair, it does not augur well for railroads.

A more serious threat for the future is the loss of coal and other fuel traffic through the development of the natural-gas pipe lines which take this form of fuel direct from its underground source to points of utilization. Distance no longer seems to be an obstacle. The many advantages of this form of fuel account for its general adoption. Likewise, the transmission of electrical energy for power purposes from water sites and coal fields threatens to deprive railroads still further of their traffic in coal. At the present time car loadings of coal constitute 17.5 per cent of the revenue loadings of all railroads in the United States.

Lastly may be mentioned the competition of the airways. Although competition from this source is not yet serious, the speed of air transportation is likely to find favor in the carriage of higher-class mails and valuable express. The recent gains in air passengers in the United States, following the more highly developed European systems, may prove a further drain on passenger traffic of railroads. That the railroads are alive to this situation is attested by the rail-air route recently established by certain railroads themselves. The following table shows the gains in scheduled air transportation operations from 1929 to 1931.

TABLE 28.—AIR TRANSPORTATION OPERATIONS

Item	1931	1930	1929
Passengers	425,000	385,910	165,263
Air mail, pounds	9,200,000	8,005,201	7,096,930
Express, pounds	900,000	286,798	197,538
Miles flown	41,800,000	28,833,967	20,242,891
Planes	753	637	619
Employees	7,000	6,350	4,430
Operators	40	35	27

Present Trend in Railroad Traffic.—The trend in railroad freight traffic for the past 40 years may be observed from the average annual ton-miles of revenue freight hauled. By 5-year periods this has been as follows:

TABLE 29 —RAILWAY FREIGHT TRAFFIC (ALL ROADS), 1891-1930

Year	Ton-miles of Revenue Freight (Yearly Average)	Year	Ton-miles of Revenue Freight (Yearly Average)
1891-1895	85,693,000,000	1911-1915	277,073,000,000
1896-1900	113,962,000,000	1916-1920	390,815,000,000
1901-1905	167,715,000,000	1921-1925	375,468,000,000
1906-1910	228,936,000,000	1926-1930	430,680,000,000

During the past decade freight traffic has tended to increase much less rapidly than during the preceding decades. The annual figures are as follows:

TABLE 30 —ANNUAL FREIGHT TRAFFIC (ALL ROADS), 1920-1930

Year	Ton-miles of revenue freight	Per capita on average annual basis	Year	Ton-miles of revenue freight	Per capita on average annual basis
1920	413,699,000,000	3,883	1926	447,444,000,000	3,840
1921	309,533,000,000	2,861	1927	432,014,000,000	3,655
1922	342,188,000,000	3,114	1928	436,087,000,000	3,638
1923	416,256,000,000	3,732	1929	450,189,000,000	3,704
1924	391,935,000,000	3,462	1930	387,664,000,000	3,146
1925	417,418,000,000	3,634			

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CHAPTER XVI

RAILROAD REGULATION

The regulation of public-service enterprises by governmental authority is found in many countries today. Moreover, its historical antecedents reach far back into the dim past. An appreciative attitude of the student of investment and finance toward the general problem of regulation today can be gained only by following the thread of historical evolution.

The Power of Regulation—The ultimate basis of public control of economic enterprise and of social relations lies in the common welfare of the people. The means of attaining this is through the sovereign power of the state itself. The justification for exercising this power in other than democratic countries lies in the enlightened paternalism of the rulers. But where democratic government has gained sway, justification for the power proceeds directly from the people themselves. The extent of public control of private affairs in the different periods of historical evolution depends upon the social philosophy of welfare current at the time.

Early Antecedents.—The Hebrews provided against false weights and measures, adulteration, speculation, monopoly, usury, and the like. In all these the underlying conception was the control of price and profits in the interest of true values. These undoubtedly rested upon the concept of cost or effort, in the absence of which false values prevailed. Whatever discrepancy there was between cost and price represented the false element and was to be eschewed.

Apparently the Roman world entertained a different idea of price. Price in those times had a "common validity" and the jurists were committed to a *régime* of competition and private contract in ordinary economic affairs. Doubtless the Romans were convinced that unrestricted private enterprise produced the most satisfactory results. But gradually the doctrine of just price (*verum pretium*) made its way into Roman consciousness and legal restrictions upon the general practice were observable. Upon two special occasions, in 285 and 301, Emperor Diocletian fixed maximum prices on upward of 700 commodities. These edicts came to offset the effect of debased currency, high taxes, and increased cost of living, and were prompted by fear of revolution. Thus the power to regulate price was clearly possessed and exercised in accordance with the economic precepts of the times.

Mediaeval Regulation.—With the development of mediaeval town democracy emerged the idea of commonalty. The common law itself was a product of the free town. Common or public callings were in contrast to private employment, which itself was a feudal conception and referred to the superior status of the nobleman in relation to the serf. Common callings were those whose service was available to the public in general, that is, to fellow-craftsmen and fellow-merchants of the town. Common callings included those of the common carrier, the innkeeper, the hackman, the tailor, the miller, the barber, the baker, the blacksmith, and the like.

The historical climax of the exercise of public authority over private business was probably reached in the mediaeval guild regulations of the incorporated towns and in the rule of the manorial lords in the villages. Not only was price controlled but the quality of service and trade practices were also strictly regulated. The fishmongers and the bakers dealing in the necessities of life were constantly running foul of the guild authority in their practices of regrating, forestalling, and engrossing. Similarly, outsiders were constantly subjected to surveillance lest they escape the trade restrictions of the guilds. Guild regulations and judicial rule of the times were "illustrative merely of the all-pervading spirit of authoritarian control of industry and life."¹

The idea of a just price permeating the legal thought of the Roman people in their later days was developed by the Fathers of the Christian Church and reached its most authoritative statement in the writings of St. Augustine and St. Thomas Aquinas. Ecclesiastical theory and canon law allowed the inclusion in just price of cost of producing and handling, cost of labor, transportation, storage, interest on capital, and compensation for risk.

Common-law Basis of Control.—In all this the outstanding fact was that of a monopoly engaged in supplying the public with a necessity. Within this are the three indispensable elements of the situation, namely, monopoly, necessity, and the public. All three elements were combined to justify the all-embracing control of industry by public authority. Monopoly was of two kinds, natural and legal. The wharfinger, the ferryman, and the warehouse keeper were examples of the former. The latter were represented by the baker, the blacksmith, the candlestickmaker, the miller, and the like. Their regulation proceeded from the monopolistic organization of guild society in the several trades and callings. Midway between these classes fall the common carrier, the common innkeeper, the common surgeon, each possessing some element of natural monopoly to which was added legal sanction for exclusive performance of service. In all these cases it will be observed that the customers or patrons were coerced and placed in a position of dependence which required the

¹ M. G. GLASSER, *Outlines of Public Utility Economics*, pp. 168-169.

protection of public authority Hence no alternative to public regulation was approved and it became the accepted order of life

Mercantilism.—With the advance of central over local government came also a change from local to national control, as exemplified in the mercantilist doctrines of the period Regulation of manufactures, navigation, and the tariff absorbed the attention of statesmen in their efforts to secure a favorable balance of trade and an inflow of the precious metals. National governments chartered corporations with monopolistic privileges, endowed them with the power of government, and used them as an arm of the state in carrying out their purposes. Numerous monopolistic charters were granted to companies for the development of new domestic industries involving secret processes In this development of granting charters and licenses with exclusive privileges is to be found "the origin of our modern notion of a public-service corporation."¹ An expression of the legal position in cases involving monopolies dealing in necessities and operating under an exclusive grant is found in *De Portibus Maris* In speaking of the wharfinger Lord Hale said.

If the king or subject have a public wharf unto which all persons that come to that port must come as for the purpose to unlade or lade their goods, because they are the wharfs only licensed by the queen or because there is no other wharf in that port, as it may fall out where a port is newly erected, in that case there cannot be taken arbitrary and excessive duties or crantage, wharfage, pesage, and so forth, neither can they be enhanced to an immoderate rate, but the duties must be reasonable and moderate though settled by the king's license or charter For now the wharf and crane and other convenience are affected with a public interest and they cease to be *jura privata* only As if a man set out a street in new building on his land, it is no longer bare private interest, but is affected with a public interest.²

Laissez Faire.—But times were changing in England and there appeared already in Elizabeth's time strong opposition to excessive control of industry So burdensome had this control become that in 1624 the Statute of Monopolies was passed which abolished most of the domestic privileges granted to the favorites of the Court

There followed the philosophical individualism of the seventeenth and eighteenth centuries which manifested itself in the realm of economics as *laissez faire* The core of this new economic philosophy was natural or competitive price based upon supply and demand as opposed to a just price based upon cost of production This system of thought was rooted and nourished in the free market towns and fairs of the Middle Ages Its program included the removal of obstructions to the free exchange of domestic products and the breaking down of barriers to the free

¹ GLAESER, *op cit*, p 159

² *Idem*

movement of products in international trade Adam Smith was its chief exponent His *Wealth of Nations* in a sense is an answer both to the regulations of the mediaeval guilds and to the doctrines and practices of mercantilism The common welfare of the people was now to be sought through individual initiative and free enterprise The function of the state was that of an umpire which insured fair play to all

But the philosophy of *laissez faire* did not encompass the occupations of public calling which continued to be affected with a public interest Their obligation to provide service at reasonable rates continued.

Regulation in America.—The relation of public authority to private enterprise in colonial America was largely a reverberation of English development The transplanting of the English legal system to American soil carried with it the control of prices of ordinary commodities Thus Massachusetts in 1635 and Plymouth in 1668 regulated the prices of such commodities as tobacco, beer, bread, meat, and corn But the leaven of *laissez faire* was already at work Conditions were hard in pioneer America Transportation was difficult and the pioneer was generally beyond the reach of organized law As the population moved to the interior regions and thence beyond the Alleghanies to the unspoiled wealth of those vast territories, there developed an accentuated form of individualism and *laissez faire* In this atmosphere the old formulas of price control by public authority were forgotten, and free, unrestricted private enterprise was left in almost full possession of the field In the midst of this intensive development of a far-flung but sparsely settled territory, railroads and other public utilities had their beginning

But the relaxation of price control by public authority was not universal More and more, as free enterprise gained in scope, it became necessary to define the characteristics of occupations which would render them subject to public supervision There seems never to have been any doubt but that common carriers possessed those qualities which were affected with a public interest In addition, common carriers used the public highway maintained by public authority Public highways had always been public utilities free to all and they seemed to form the logical and historical starting point Turnpikes were merely public highways whose construction upon grounds of expediency was authorized to private capital enfranchised by legislative action. Bridges merely replaced the ferries and these plainly came within the same category. Canals and railways likewise were transportation agencies and like the turnpike and ferry were common carriers Even in its early history the telegraph was considered a common carrier of messages The term "common carrier" seemed to embrace the entire category of public utilities ¹

¹ "Whether the use of the railroad is a public or private one depends in no measure upon the question who constructed it or owns it It has never been considered a

Charter Restrictions.—When it came to granting the early charters for railroads, special acts creating corporations merely continued the precedent already established with reference to this class of corporations. Among the provisions of some of the early charters may be found clauses setting maximum rates and fares, requiring publicity of rates actually in force, prohibiting discriminations, making of annual reports, and the like. But owing to steady reductions in cost of operation the maximum charges mentioned in the charters were almost invariably higher than the actual rates in force and were consequently ineffective.

But historical precedent did not cover the case presented by certain new industries. These were first the gas light, then the telegraph, the telephone, the electric light, street railways, water companies, and the like. For these certain old economic criteria were reinvoked. The twin conceptions of monopoly and necessity were the core of the matter. Monopoly meant control of the supply, or control of conditions which render competition unnatural and wasteful. Necessary services embraced those services that are recognized to be superior to other alternatives, as for example electric lighting is superior to candle lighting.

Early Statutes.—Scattered efforts at regulation by legislation are found prior to the Civil War. These early statutes dealt with matters very much the same as the earlier charter provisions, including safety of travel, taxation, stock subscriptions and transfers, reports, and in several instances maximum charges for service. There is an early case of passenger fares on the New York Central being limited to 2 cents per mile. Early freight-rate regulation was based on the distance of the haul, the so-called "pro rata" or "equal-mileage" laws. These were based on a vague consciousness of the cost-of-production principle.

Although regulation itself had its beginnings in the seventies, prior to this time several states had set up commissions with supervisory powers. In 1855 New York passed a law relating to a commission but it never became effective. Not until 1869, with the establishment of the Massachusetts commission, do we encounter anything permanent in this form of regulation. Although this commission possessed no mandatory powers, under the incumbency of Charles Francis Adams, Jr., as commissioner, himself a scholar and man of practical affairs, it accomplished

matter of any importance that the road was built by the agency of a private corporation. No matter who is the agent, the function performed is that of the state. Though the ownership is private, the use is public. So turnpikes, bridges, ferries, and canals, although made by individuals under public grants, or by companies, are regarded as *publici juris*. The right to exact tolls or charge freights is granted for a service to the public. The owners may be private companies, but they are compellable to permit the public to use their works in the manner in which such works can be used"—83 U S 695 (1873).

much of lasting value. It worked in the spirit of cooperation with the railroads, introduced improved methods of accountancy, and was instrumental in securing the adoption of safety appliances. Supervisory activities were carried on by the New England states, while New York, New Jersey, and Ohio appointed officers whose function was the collection of statistics relating to traffic and the finances of the roads.¹ These early commissions busied themselves for the most part with prevention of accidents and with the general safety and convenience of the traveling public, with appraisal problems arising from the exercise of the power of eminent domain granted to all railroads, as well as with the acquiring and publishing of statistical information and with cultivating cooperative relations with the railroads. Over rates they had no control beyond legal or charter restrictions.

The Background of Regulation.—The movement to regulate rates first came into prominence in connection with the Granger movement in the period 1870–1877, more especially after the panic of 1873. It was in the upper Mississippi Valley where the greatest recent activity in railroad construction had taken place that the Granger movement became the strongest. Between the years 1865 and 1871, over \$500,000,000 had been invested in western railroads where the policy of land grants and local subsidies reached its maximum. By 1873, 9,000 miles of railroad had been built in the frontier states lying between the Mississippi and Missouri Rivers and an additional 12,000 miles in Illinois, Wisconsin, Kansas, and Nebraska. The result was too rapid settlement and overproduction of wheat and corn, followed by falling prices and bankruptcy of farmers.²

In the face of declining agricultural prices, even before the panic of 1873, the agricultural interests directed their attack against railroad rates as the one tangible method of seeking relief. The congressional committee on the causes of agricultural depression headed by Senator Windom spoke of the "imperative necessity for cheaper means of internal communication." To the charge of excessive rates was soon added that of discriminatory rates. Discriminations in rates

¹ E. R. JOHNSON, G. G. HUEBNER, and G. L. WILSON, *Principles of Transportation*, p. 291.

² The price of wheat at New York in 1867 reached \$3.175 and dropped to \$1.225 already in 1870, while corn dropped from \$1.81 in 1865 to about \$0.55 in 1873.—G. F. WARREN, *Prices of Farm Products in the United States*, *Bulletin* 999, pp. 29–30, U. S. Department of Agriculture. The drastic decline in agricultural prices was but a reflection of the increased production of these newer areas. The acreage utilized for grain production in the United States rose from about 65,000,000 in 1867 to over 100,000,000 in 1878, and the yield increased from 1,320,236,000 in 1866 to 2,290,008,000 in 1878.—A. D. NOYES, *Forty Years of American Finance*, p. 3. Agricultural profits thus disappeared and reduction in freight rates which appeared to the farmers to be excessive was the one tangible method of restoration in part at least of farm profits.

in favor of the primary points and important shippers became the rule. But in the absence of competition for local traffic and through traffic originating in agricultural communities, rates for these services remained high. Long-distance traffic quite generally carried a rate from one-half to one-third that for traffic originating at points between primary terminals.¹

Regulation by Competition—At first, the courts and legislatures relied upon the general theory of free competition to secure a just charge for the services rendered. But transportation services are largely local or sectional in character and here little or no competition is possible. With respect to through traffic it was otherwise and this was doubtless of commanding importance to those in public authority. As observed by an early writer on railroad transportation, competition here may serve as a regulator of profit on the capital invested, but "as a regulator of rates it is a failure."²

Granger Laws.—The Granger organizations of the Middle West took up the fight for state regulation of railroad rates. Illinois pioneered the way. In the revision of its constitution in 1870, railways were declared public highways and their regulation by legislature was made mandatory. In 1871 the legislature thus established maximum passenger rates, forbade discriminations and extortion in freight rates, and created a state railroad and warehouse commission. The railroads contested this law and won a favorable decision in 1873 from the Supreme Court of the state.³ In the same year the legislature enacted the first general railroad law dealing with rates and directed the commission to fix maximum freight and passenger rates for the railroads of the entire state. This measure placed the burden of proof upon the railroads in case there was any question about the reasonableness of rates. It became the basis of subsequent state regulation. The experiences of Illinois were paralleled in Minnesota and Iowa, both finally abandoning all efforts at rate-making, being content to endow their commissions only with power to investigate and report. The Potter law in Wisconsin enacted in 1874 (repealed in 1876) was far more drastic than the laws of other states. It provided for maximum rates and a commission with mandatory powers. The reduction of rates in Wisconsin soon threw the roads into an impoverished condition, many of them being unable to pay interest on bonds, railroad construction ceased and foreign capital withdrew further support.

The establishment of the Massachusetts commission in 1869 has already been referred to. Iowa established a commission in 1878 which was successful in compromising the difficulties between the railroads and the public whose interests by this time were recognized to

¹ E. JONES, *Principles of Railway Transportation*, p. 106.

² A. T. HADLEY, *Railroad Transportation*, p. 129.

³ 67 Illinois Reports 11-27 (1873).

be mutual¹ By 1878, 16 states had set up railroad commissions These became a part of the administrative machinery of state governments The common purpose was to guard against "unjust discriminations" and "any irregularities of rates or privileges" and service in general² By this time complaints had shifted from excessive to discriminatory rates This was doubtless due in part to the numerous bankruptcies among railroads following the panic of 1873³ Partial restoration of agricultural prices served to allay the opposition to high rates

The Constitutional Power to Regulate.—The Granger laws raised the question of the constitutionality of regulation of rates by law. Eight cases came to the Supreme Court of the United States in 1876, all involving this question The railroads based their main argument upon the Fifth and the Fourteenth Amendments to the Federal Constitution which read as follows

Nor shall any person . . . be deprived of life, liberty or property, without due process of law, nor shall private property be taken for public use without just compensation —*Fifth Amendment*

Nor shall any state deprive any person of life, liberty or property without due process of law, nor deny to any person within its jurisdiction the equal protection of the laws —*Fourteenth Amendment*

These cases were considered together but the enunciation of fundamental principles came in connection with the Munn case This case dealt with the validity of an Illinois law establishing maximum rates for the storage of grain in a public elevator The court recited the monopolistic circumstances surrounding the elevator business in Chicago, in that it stood "in the very gateway of commerce and taking toll from all who pass" It went on to say that "it had been customary in England from time immemorial and in this country from its first colonization to regulate ferries, common carriers, hackmen, bakers, millers, wharfingers, innkeepers, and so forth," and to fix maximum charges It showed that from early times a broad distinction had been made in law between business of a strictly private nature and business that is "clothed with a public interest" It cited the language of Lord Hale in *De Portibus Maris* and went on to say that property was

¹ Other states which copied the Massachusetts example were Connecticut, Maine, Michigan, Minnesota, New Hampshire, New York, Ohio, Rhode Island, Vermont, Virginia, and Wisconsin Illinois, Kansas, Kentucky, and Missouri endowed their commissions with wider powers

² *First Annual Report, Iowa Board of Railroad Commissioners, 1878*

³ In 1877 there were 85 companies operating 13,972 miles of road, or 18.19 per cent of the total mileage of the country, in receivership —H. H. SWAIN, *Economic Aspects of Railroad Receivership*, p. 70

affected with a public interest . . . when used in a manner to make it of public consequence, and affect the community at large. When, therefore, one devotes his property to a use in which the public has an interest, he, in effect, grants to the public an interest in that use, and must submit to be controlled by the public for the common good.

Railroads were "affected with a public interest" and it followed that the state had a right to regulate them.

The federal government possesses no police power as such, but its power to regulate railroads rests upon powers delegated to it and contained in the Constitution. Of interest here are the following grants: (1) the power to regulate interstate and foreign commerce, (2) the power to establish post offices and post roads, and (3) the power to prosecute war and provide for the common defense and welfare.

Federal versus State Authority.—Although the Constitution delegates to Congress the power to regulate interstate commerce, certain decisions in the Granger cases seemed to open the way for the state legislature to occupy the entire field of regulation to the exclusion of federal authority. Consequently under the commerce clause the railroads attacked the constitutionality of the Granger laws. But in *Munn v. Illinois*¹ the Supreme Court said regulation was a matter wholly of the state of Illinois, since Congress had not chosen thus far to exercise its power. Again in *Peik v. Chicago & Northwestern Railway Company*;² the Supreme Court allowed state regulation of rates to apply on interstate traffic putting it thus: "Until Congress undertakes to legislate for those who are without the state, Wisconsin may provide for those within, even though it may directly affect those without." The states seemed in a fair way of realizing preeminence in the field of railroad regulation, so that, by the time of the passage of the Interstate Commerce Act in 1887, many states had established regulatory commissions. But in 1886, in the *Wabash* case,³ the court completely reversed itself and state regulation received a distinct blow. The court declared that the regulation of interstate freight rates was exclusively within federal jurisdiction, even though Congress had not acted. It was not until the *Minnesota Rates* cases in 1913, however, that cases of this kind were finally adjudicated. The question arose as to freight charges from Duluth and Superior to points in Minnesota. Minnesota had reduced rates from Duluth to points within the state, thus placing Superior at a disadvantage. The commissions of eight states filed briefs in support of the lower rates. Although the states won the case the

¹ 94 U. S. 135, 94 U. S. 163.

² 94 U. S. 178.

³ *Wabash, St. Louis and Pacific Railway Company v. Illinois*, 118 U. S. 557-596 (1886).

court asserted the "supreme and plenary" power of Congress to regulate interstate commerce

But the scope of state jurisdiction was left unsettled in the Minnesota cases because the question of fact as to discriminatory rates had not been passed on by the Interstate Commerce Commission. The commission soon passed upon this point in the case of Shreveport in 1914. The Supreme Court said, "wherever the interstate and intrastate transactions of carriers are so related that the government of one involves the control of the other, it is Congress, and not the state, that is entitled to prescribe the final and dominant rule."¹

The present status of the power of the federal government over railroad rates may be summarized as follows: (1) the regulation of interstate rates, (2) compulsion of state authorities to raise intrastate rates when they discriminate against interstate commerce in a material way, (3) the control of intrastate rate levels as a whole in order properly to distribute the cost of the transportation system of the country, and (4) the compulsion of states to raise particular intrastate rates when such rates do not produce their fair share of the revenue to support the railroad system.²

Interstate Commerce Act of 1887.—In 1872, following the recommendation of President Grant, Congress appointed a committee, the Windom Committee, to investigate the possibility of "more certain and cheaper transportation of the constantly increasing surplus of western and southern products to the Atlantic seaboard." In its report³ in 1874, this committee recommended improvement of waterways and the construction of a double-track railroad from the Mississippi River to the Atlantic seaboard, relying on competition to control freight rates. During the next decade competition of the railroads among themselves brought drastic reductions in rates, so that a decade later the grievances were not high rates but discriminatory rates, as to localities, persons, and commodities.

The Interstate Commerce Act of 1887 was the direct result of the report of the Cullom Committee of 1886 (a Senate Committee) and the Wabash decision of the Supreme Court in the same year. The Cullom Committee charged that the paramount evil in the railway system was the personal discrimination in rates. It also emphasized discrimination between places and different kinds of commodities. In submitting a bill to Congress the committee said, "The underlying purpose and aim of the measure is the prevention of these discriminations."⁴

¹ *Houston, East and West Texas Railway Co. v. U. S.*, 234 U. S. 342.

² See E. R. JOHNSON, G. G. HUEBNER, and G. L. WILSON, *Principles of Transportation*, p. 297.

³ *Senate Report*, 307, Forty-third Congress, First Session.

⁴ *Senate Report* 46, Forty-ninth Congress, First Session, p. 215.

The decision in the Wabash case brought 75 per cent of all traffic under federal jurisdiction and opened the way for federal regulation which materialized in the Interstate Commerce Act of 1887. Its main provisions were: (1) all rates should be reasonable and just—a provision which was found in almost every state constitution dealing with the matter, (2) personal and local discrimination were forbidden, (3) pooling was forbidden, (4) a long-and-short-haul clause was included, (5) the commission was authorized to require annual reports from railroads and to regulate the manner of reporting, including a system of uniform accounts. The act made no fundamental change in the theory of regulation as far as interstate rates were concerned. Here competition between the main points was still relied upon to secure low rates. Where competition was not effective, the long-and-short-haul clause offered a remedy for excessive rates. Regulation of the general level of rates was not a part of the legislation.

In the early years of the commission the railroads lent their cooperation in eliminating the chief grievances against which the act was directed. But later opposition of railroad officials and large shippers, as well as the hostility of the courts, developed. The Compulsory Testimony Act passed in 1893 giving witnesses proper protection in giving their testimony, and upheld by the Supreme Court in 1894 and 1896, gave the commission undisputed right of examination of witnesses.

But the commission still lacked the power to enforce its orders. Railroads had the right of appeal to the Supreme Court, which on the average delayed enforcement 4 years. This, together with the position of the courts in accepting new evidence, minimized the position of the commission.

The final blow to the power of the commission over rates came in 1897 in the Cincinnati Freight Bureau case¹ where the Supreme Court said "the power to prescribe rates or fix any tariff is not among the powers granted to the Commission." This came after 10 years of rate revisions involving some 70 cases during which time the power of the commission over rates had gone unquestioned. The commission under this decision could determine only whether a particular rate was reasonable or not. Whatever of power over rates remained to the commission under the long-and-short-haul clause was destroyed in an adverse decision by the Supreme Court in the same year.² These cases deprived the commission of any effective power and left it only with the power of reporting and protesting.³

¹ 167 U. S. 479-512 (1897).

² Interstate Commerce Commission v. Alabama Midland Railway Co., 68 U. S. 144-177 (1897).

³ JONES, *op. cit.*, p. 230.

Judicial Review.—Even if legislatures had the power to fix rates, the railroads claimed protection under the courts against legislative excesses. Although their property may be clothed with a public interest, they were at least entitled to reasonable rates under the Fifth Amendment to the Constitution. But the Supreme Court said that

In countries where the common law prevails, it has been customary from time immemorial for the legislature to declare what shall be a reasonable compensation under such circumstances [with property devoted to public use]. For protection against the abuse by the legislatures, the people must resort to the polls, not to the courts.¹

But the doctrine of non-interference of courts was to undergo a reversal within the next 15 years. Already in 1886 the court said (only incidentally however),

It is not to be inferred that this power of limitation or regulation is itself without limit. This power to regulate is not a power to destroy, and limitation is not the equivalent of confiscation. Under pretence of regulating fares and freights, the state cannot require a railroad corporation to carry persons or property without reward, neither can it do that which in law amounts to a taking of private property for public use without just compensation, or without due process of law.²

The definite enunciation of the right of judicial review came in 1890 when the court said, "The question of the reasonableness of a rate of charge for transportation by a railroad company, involving as it does the element of reasonableness both as regards the company and as regards the public, is eminently a question for judicial investigation, requiring due process of law for its determination."³ In 1914 the Supreme Court definitely stated that the facts established by the commission were not open to review, saying that the court will not "substitute its judgment for that of the Commission upon matters of fact within the Commission's province."⁴

The Elkins Act of 1903.—This act, whose origin is attributed to the railroads,⁵ strengthened the Act of 1887 by making corporations liable against rebates and by making illegal any secret departure from published rates. This operated in favor of the railroads to increase their revenues.

The Hepburn Act of 1906.—For a decade following the decisions of the Supreme Court in the late nineties, rate regulation was a lost cause

¹ *Munn v. Illinois*, 94 U. S. 1324-1331.

² *Stone v. Farmers' Loan and Trust Company*, 116 U. S. 331.

³ *Chicago, Milwaukee and St. Paul Railway Company v. Minnesota*, 134 U. S. 458 (1890).

⁴ *Los Angeles Switching case*, 234 U. S. 294.

⁵ *JONES, op. cit.*, p. 234.

and railroads conducted themselves with little respect to public authority. Having been deprived of their pooling agreements by the Act of 1887, they attempted to form agreements fixing rates. But the Supreme Court in 1897 and 1898 held that this was an infringement of the Sherman Anti-trust Act of 1890 and therefore illegal. There followed the era of consolidation and concentration of control. It was shown that 39 persons held the majority control in practically every railroad east of the Mississippi River. Added to this were the activities and still greater ambitions of E. H. Harriman who had obtained control of the Union Pacific and Southern Pacific by 1901 and was blocked in his efforts to acquire the Atchison, the Northern Pacific, the Southern Pacific, and Atlantic Coast Line. After 1898, with the concentration of control, came numerous advances in freight rates which were the result of concerted action by the railroads.¹ The public feared too that the action of the railroads was leading to concentration in industry in general.

The situation led to a series of acts by Congress designed to strengthen the authority and power of the Interstate Commerce Commission. The Expedition Act of 1903 gave precedence to cases arising under the Interstate Commerce Act and the Sherman Act where the interest of the public was paramount, thus shortening the time elapsing before the commission's orders might become effective.

But the failure of federal authority to exercise any real control over railroad rates led to the enactment of many additional state laws dealing not only with rates but also with finances, service, and safety. Between 1903 and 1907, 22 states passed maximum-fare laws, while 9 enacted maximum-rate laws. Also from 1905 to 1907, 15 commissions were established, 13 of which were of the mandatory type and 5 had authority to fix rate schedules for all intrastate traffic.²

Under this act the members of the commission were increased from five to seven, thus making it a larger and more important body. Its jurisdiction was extended so as to include express and sleeping car companies among common carriers. Pipe lines for transportation of oil for the public were also brought under its jurisdiction. It included the regulation of all accessories to transportation such as switches, spurs, tracks, terminal facilities, freight depots, and yards.

The Hepburn Act also provided for an adequate system of accounts. It provided for annual reports to the commission under oath, monthly reports of earnings and expenses, and special reports at the discretion of the commission. The commission was empowered to prescribe the form of all accounts to be kept by the carriers. It was to have free

¹ JONES, *op cit*, p. 232.

² 32 *Annals of the American Academy of Political and Social Science*, pp. 146-147, article by G. G. Huebner; referred to in E. Jones, *Principles of Railway Transportation*, p. 202.

access to inspect and audit all accounts and appoint examiners with authority sufficient to accomplish its purposes. Adequate powers of enforcement were also granted. The accounts established by the commission under this act have become models of uniformity and accuracy and have aided the commission in its work. They enable the security holder at all times to know the exact status of the financial affairs of the company.

This act effectively removed all discriminations by bringing under the control of the commission the "industrial railways" which in fact were only switches or spurs of the railroads themselves but owned by the shippers. They became a source of large rebates to shippers and the commission was given the power to control switching charges. Private cars too were brought under the commission, thus eliminating another source of rebates. Free passes, except for employees and their families, for persons engaged in religious or charitable occupations, and for paupers, were forbidden. This eliminated much favoritism to political officers and journalists.

The most important part of the act was the granting of power to establish maximum rates and fares. After hearing and upon complaint, if convinced that rates were unjust or unreasonable, unjustly discriminatory or unduly preferential, maximum rates could be prescribed to take effect in 30 days and to continue for 2 years unless otherwise set aside. The court was directed to enforce the commission's orders if "regularly made and duly served." The Hepburn Act did not disturb the final jurisdiction of the courts which retained the power of suspension of rates fixed by the commission pending the establishment of their reasonableness. In other respects this act was a thoroughgoing piece of legislation intending to establish beyond question federal regulation of railroads.

The primary jurisdiction of the commission in fixing rates under the Hepburn Act was affirmed in 1910 by the Supreme Court.¹ Finally, the position of the Supreme Court with reference to the commission was stated in 1912 in the Pacific Coast Lumber case. The orders of the commission were final unless they exceeded constitutional or statutory authority or were based upon a mistake of law. Orders may also be set aside if

the rate is so low as to be confiscatory and in violation of the constitutional prohibition against taking property without due process of law, or if the Commission acted so arbitrarily and unjustly as to fix rates contrary to evidence, or

¹ Interstate Commerce Commission v. Illinois Central Railroad Company, 215 U. S. 452-478 (1910).

Baltimore and Ohio Railroad Company v. U. S., 215 U. S. 481-500 (1910).

Interstate Commerce Commission v. Chicago, Rock Island and Pacific Railway Company, 218 U. S. 89.

without evidence to support it, or if the authority therein has been exercised in such an unreasonable manner as to cause it to be within the elementary rule that the substance, and not the shadow, determines the validity of the exercise of the power. In determining these mixed questions of law and fact, the Court confines itself to the ultimate question as to whether the Commission acted within its power. It will not consider the expediency or wisdom of the order, or whether, on like testimony, it would have made a similar ruling.¹

The Mann-Elkins Act of 1910.—This act extended the jurisdiction of the commission to telegraph, telephone, and cable companies engaged in interstate or international communication, thus converting it into a public-utility commission. The most significant provision of this act was the lodging with the Interstate Commerce Commission the power to suspend changes in rates and fares initiated by the railroads. Under the Hepburn Act the commission could act only after a complaint by a shipper followed by a hearing. In the interval the rate as established by the railroad remained in effect. The Mann-Elkins Act provided that the commission might suspend rate changes for 120 days and extend the time for 6 months (reduced to 30 days in 1920), if necessary, pending a hearing and decision. It amended the long-and-short-haul provision so as to render it effective in rate-making. Under this act the commission could enforce, after hearings, on its own initiative freight classifications and rates where the long-and-short-haul principle was not observed. The commission was also given the power to fix maximum rates after a hearing begun upon its own motion. It was given power over classification of freight.

In spite of all these acts, the commission was without power to establish minimum rates, to make a physical valuation of railroad property, to regulate new securities, or to regulate intrastate rates even if they discriminated against interstate commerce.

The rate policy of the commission under its new powers was restrictive. On several occasions, in 1911, 1914, 1915, and 1917, the railroads petitioned for rate increases. The decisions were mostly adverse to the railroads. Only in 1914, after the outbreak of the war, was a general advance allowed—an increase of 5 per cent. On the other occasions, the commission was content to allow some concessions on certain commodities. It rather favored changes in the rate structure upon the proposal of the railroads. It suggested, further, increases in passenger fares, higher charges for special services, restriction on free passes, more favorable contracts with sleeping car companies, and more economical operation.

Nevertheless, the decision of 1914 was of great significance and marks a turning point in the commission's policy of rate regulation. It was

¹ Interstate Commerce Commission v Union Pacific Railroad Company, 222 U S 547 (1912)

no longer a question merely of the reasonableness of certain rates with reference to shippers, but attention was now directed to the general level of rates with the thought of providing railroads with sufficient earning power to protect their credit

The Panama Canal Act of 1912.—In general this act provided for the government of the Panama Canal Zone and the operation of the canal. Its significance for present purposes lies in the fact that it extended the authority of the Interstate Commerce Commission to the inter-company relations between independent rail and water transportation ¹ This act prohibited railroads from owning or controlling competing ship lines operating through the Panama Canal or otherwise, or any vessel carrying freight or passengers through the canal, it made compulsory physical connection of rail and ship transportation for through rail-water routes and gave authority to establish joint maximum rates. It also enabled the commission to prescribe the maximum railroad rates in connection with ports and to establish connection with all ocean routes in foreign trade, especially prohibiting exclusive or monopolistic contracts or arrangements between rail and water carriers

The Clayton Act of 1914.—Regulation of railroad security issues had long been advocated by the Interstate Commerce Commission. Effective regulation was hardly possible without such power. This was forcibly brought before the public in the financial scandals of the New Haven, Rock Island, and others This act provided that no commercial corporation (including railroads) should acquire, either directly or indirectly, stock in any similar corporation where the substantial effect was to lessen competition, to restrain commerce, or to create a monopoly The prohibition specifically included holding companies, organized subsequent to the act, from bringing about similar results This act also prohibited after 2 years common carriers from engaging in commercial contracts with other companies, or purchasing supplies from them, to an amount exceeding \$50,000 in any one year when a director, officer, or agent of a railroad also held a similar position with the second company except after competitive bidding

The present status of the Interstate Commerce Act with its amendments may be briefly summarized (1) It gives the Interstate Commerce Commission jurisdiction over railroads and through routes with water lines when under control of railroads for continuous rail and water shipment, over through freight routes by steam and electric railways; over pipeline transportation except for water or gas, and over public telegraph, telephone, and cable companies, express companies, and sleeping car companies. It also covers agencies incidental to railroad transportation such as car floats, ferries, switches, tracks, terminals and terminal facilities

¹ Rail and water carriers operated under identical control had been brought under the Act of 1887

ties, locomotives, cars, vessels, and services incident to receipt, delivery, elevation, transfer, refrigeration, icing, storing, and handling of property under transportation (2) It also controls traffic passing through foreign territory but originating in, and destined for points within, the borders of the United States and foreign traffic moving within the borders of the United States (3) The carriers are duty bound to establish only just and reasonable rates, classifications of through rates, and other regulations in matters incidental to rates Most free passes are abolished (4) Unjust personal or local discrimination in rates as well as secret rebates, drawbacks, and falsifications leading to rate advantages are forbidden to both railroads and shippers, under penalties Any departure from the lawfully published rates is forbidden (5) Higher charges for short hauls than for long hauls on the same route are forbidden except by order of the commission (6) Schedules of all charges levied upon shippers for any reason must be filed with the commission and kept for public inspection (7) The commission and the public must be notified of all changes in charges 30 days before they are to take effect ¹

Reasonable Rates.—The doctrine of reasonable charges for public service is imbedded deeply in the ancient common law of England The control of charges in the case of warehouses, wharves, and the like has already been referred to In early American charters for turnpike, bridge, and canal companies it was common to place a limitation upon the tolls that were to be charged or the dividends that were to be paid When the Illinois legislature established the first state commission with power to fix rates, it required that rates be reasonable Likewise when the Interstate Commerce Act was passed it provided that all charges "shall be reasonable and just" So when the matter was considered before the Supreme Court of the United States in *Smythe v. Ames* in 1898, it was said that the public had the right to be protected against "unreasonable charges for the services rendered by it" But mindful of the Fifth and Fourteenth Amendments to the Federal Constitution, it hastened to say that "the corporation may not be required to use its property for the benefit of the public without receiving just compensation for the services rendered by it" The court went on to say,

We hold, however, that the basis of all calculations as to the reasonableness of rates to be charged by a corporation maintaining a highway under legislative sanction must be the fair value of the property being used by it for the convenience of the public And in order to ascertain that value, the original cost of construction, the amount expended in permanent improvements, the amount and market value of its bonds and stock, the present as compared with the original cost of construction, the probable earning capacity under particular rates prescribed by statute, and the sum required to meet operating expenses, are all

¹ See JOHNSON, *etc*, *op cit*, pp 306-310

matters for consideration, and are to be given such weight as may be just and right in each case. We do not say that there may not be other matters to be regarded in estimating the value of the property. What the company is entitled to ask is a fair return upon the value of that which it employs for the public convenience.¹

This language forms a great landmark in the history of railway rate regulation. The court in a later case succinctly stated the substance of the principle of rate regulation when it said that what the railroad was entitled to was "a fair return upon the fair value of the property devoted to the public service." It stated also that "the ascertainment of that value is not controlled by artificial rules. It is not a matter of formulas, but there must be a reasonable judgment having its basis in a proper consideration of all relevant facts."²

The principles contained in the above language have been reiterated time and again in rate cases coming before the Supreme Court. Following the Mann-Elkins Act of 1910, the attorneys argued that contemplated reductions in rates would not allow them a fair return on the fair value of their property, the railroad executives themselves asserted that they had never attempted to fix rates upon this basis but rather upon competitive principles. Nor had Congress ever required the commission to base rates upon the value of the property.³ But railroad engineers had testified to the value of certain railroad property, introducing definite figures.⁴ This placed the commission in an awkward position, having no basis for passing judgment upon the claims of the railroads. It therefore repeatedly requested Congress to supply legislation to meet the situation. Whereupon in 1913 the Valuation Act was passed.

The Valuation Act of 1913.—This Act followed closely the language in *Smythe v Ames*. The commission is directed to

... ascertain and report in detail as to each piece of property owned or used by said common carrier, for its purposes as common carrier, the original cost to date, the cost of reproducing new, the cost of reproduction less depreciation, and an analysis of the methods by which these several costs are obtained, and the reason for their differences, if any, [and to] ascertain and report other values, and elements of value, if any, of the property of such common carrier, and an analysis of the methods of valuation employed, and of the reasons for any differences between any such value and each of the foregoing cost values

The act especially excluded capitalization from consideration. Indeed, it was the intention of the sponsors of this legislation to show whether

¹ *Smythe v Ames*, 169 U S 466, 546

² *Minnesota Rate cases*, 230 U S 352, 434.

³ Judge R. S. Lovett, of the Union Pacific Railroad Company on Dec. 21, 1910, before the Railroad Securities Commission.—Quoted in *VANDERBLUE, Railroads*, p. 355

⁴ *Spokane v Northern Pacific Railway Company*, 15 I C C. 376

or not there existed any watered stock in the railroads. The value of the property of each carrier was to be reported as a whole upon completion. After allowing for protest by the carrier and modification by the commission, this tentative valuation was to become final for rate-making purposes. Final appeal from the decisions of the commission, however, could be made to the Supreme Court.

Immediately after the passage of the Valuation Act, the commission organized the Valuation Bureau with accounting, engineering, and land divisions. The bureau soon encountered great difficulties in the attempt to ascertain the original cost of the property of the railroads, chiefly because the necessary records were nowhere to be found. This part of the act seems never to have been carried out but instead the commission appears to have substituted statements taken from the books of the railroads and used them with guarded qualifications.¹

In the pursuit of its task of finding the cost of reproduction new, the first step was to take an inventory of all railroad property—a task that consumed 8 years of the commission's efforts. Evidence from the records of railroads and manufacturers was collected to form the basis for unit prices. These were taken as of June 30, 1914, because prices as of this date seemed to represent a fair normal figure for the preceding two decades. Adjustments from this normal were made in certain individual cases. The engineers used their own processes in arriving at a final figure. In estimating cost of reproduction new, they considered what it would cost to reproduce the properties at the valuation date, to which was added from 2 to 5 per cent for engineering expenses, 1.5 per cent for general overhead expenses, and interest at 6 per cent on the total capital for one-half of the construction period plus 3 months. It refused to make any allowance for going-concern value, contending that this enters into the cost of reproduction. Likewise were considered development costs and past deficits. Moreover, no allowance was made for franchise value, good-will, or strategic position.

The act required that reports be made upon the value of land based upon original cost, the present value, and the cost of reacquiring.² The method of land valuation was based upon the experience of state commissions. The principles were stated in the Texas Midland Railroad case as follows:

Present value is arrived at by ascertaining the number of acres of land owned or used by the carrier for its purpose as a common carrier and multiplying this acreage by the market value of similar adjacent and adjoining lands. Due allowance is made for any peculiar value which may attach by reason of the peculiar adaptability of the land to railroad use.

¹ H. B. VANDERBLUE and K. F. BURGESS, *Railroads*, p. 341.

² The commission was relieved of reporting on the cost of reacquiring in 1922.

Nothing is included for the expense of acquisition, nor for severance damages, nor for interest during construction ¹

It consisted in ascertaining the acreage owned or used and this was multiplied by the value per acre of similar and adjoining lands. This method appeared to be required by the language used in the Minnesota Rate cases when Mr. Justice Hughes said the railroad was entitled to values resulting from community growth but that such values "cannot properly extend beyond the fair average of the normal market value of land in the vicinity having a similar character" ²

Depreciation in Railroads.—Depreciation was one of the elements affecting value for the purpose of determining the reasonable rates mentioned by the court in *Smythe v. Ames*. The necessity for deducting depreciation from reproduction cost for valuation purposes was voiced in the Minnesota Rate cases. The same requirement was specifically laid down in the *Knoxville Water* case ³. The Interstate Commerce Commission had followed the principle of deduction for depreciation. But neither in these cases nor in any case brought to the same court was depreciation ever clearly defined. The commission, however, in its work of valuation in the case of the Texas Midland Railroad, did define depreciation. It said,

. . . depreciation may be defined as the lessening in cost value due to the smaller number of service units in the property as found, than in the same property new. An article when new contains, so to speak, a certain number of units of service, as those units are exhausted the article depreciates. When they are all used up the service life ends . . .

There are two kinds of depreciation, physical and functional. Physical depreciation is due to deterioration through age or wear . . .

Functional depreciation results from the want of adaptation to function. While in working condition, a machine, for some reason can no longer perform the work required of it, and, therefore, although still physically fit, must go out of service. ⁴

The commission was impressed with the part functional depreciation plays in railroad property. Stations become too small, bridges become inadequate for heavier trains, while cars and engines are discarded because their type becomes obsolete.

¹ 75 I C C 53 (1918).

² 230 U S 352, 455.

³ Here the court said, "the company is entitled to earn a sufficient sum annually to provide not only for current repairs but for making good the depreciation and replacing the parts of the property when they come to the end of their life. It is entitled to see that from earnings the value of the property invested is kept unimpaired, so that at the end of any given term of years the original investment remains as it was at the beginning"—212 U S 13-14 (1909)

⁴ 75 I C C 1 (1918)

In all cases the commission employs the straight-line method of depreciation. This results in a uniform charge from year to year with respect to particular items. Scrap or salvage value was taken account of in estimating the results. The railroads objected to the theory of accrued depreciation, holding that depreciation is synonymous with deferred maintenance and that as long as the property was in condition to render the highest possible service it was fully maintained. But the courts are in full agreement with the commission in this matter.

In the actual calculation, records of replacements served the commission as the basis of depreciation figures. Arbitrary figures for life service were assigned to more or less permanent steel, masonry, or timber construction ranging from 50 to 100 years. Where the property was of sufficient age so that renewals were uniform, a flat figure of 50 per cent was used.

Final Values—The commission stated in San Pedro, Los Angeles, and Salt Lake City that

The determination of a final single sum-value for rate-making purposes is not a matter of formula or of mathematical computation. We must give all of these costs and elements of value [mentioned in the Valuation Act] that consideration which, in our judgment, they ought to be given, in view of all of the circumstances and conditions that seem to us properly to have a bearing upon the value of the individual carrier's property. We have endeavored not to reach our conclusion by attaching undue weight to any particular element of value to the extent of shutting out proper consideration of all the elements of value.¹

Although disclaiming the use of any formula, the following will produce almost the identical values assigned for 330 roads to the cost of reproduction less depreciation is added present values of lands, plus 5 per cent of the sum of these amounts, and an allowance for working capital.²

The final figures as thus arrived at are little more than a travesty upon railroad finances when taken for what they superficially seem to mean. Thoughtful people accept them merely as a basis for calculating the amount the public is willing to pay for the service of transportation and not as ends in themselves. Vanderblue remarks, "The truth of the matter is that a figure of value in the usual sense of the word is not wanted at all, but a figure which can fairly be used to apportion earnings to railroad investors, a figure which promises to reassure investors and so to assist in the rehabilitation of railroad credit."³

Transportation Act of 1920—The Transportation Act of 1920 has been pronounced "one of the great constructive pieces of legislation of our national existence."⁴ A noted authority on railroads says, "The new

¹ 75 I C C 463, 512-513 (1925)

² D P LOCKLIN, *Railroad Regulation since 1920*, p. 163

³ *Op cit*, p. 350

⁴ JOHN E. OLDHAM, *A Plan for Railroad Consolidations*, p. 5

law constructively recognizes the fundamental principle that the power to correct and punish a railroad must be exercised also to protect the railroad as well as the public"¹

The most important provision of this act relates to rates. It provides that the commission shall initiate and establish rates so that, as a whole or under groups designated by the commission, the railroads "under honest, efficient, and economical operation" and reasonable expenditures for maintenance may earn a reasonable or fair rate of return upon their property used in transportation. The commission shall give due consideration to the needs of the country for transportation and the necessity for extending these facilities "in order to provide the people of the United States with adequate transportation." The act specified that during the first 2 years of its operation $5\frac{1}{2}$ per cent be regarded as a fair return, to which one-half of 1 per cent may be added for capital improvements. The value of the property was to be determined by the commission utilizing the data available under the Valuation Act of 1913 (or final valuations of individual roads if available) and should give due consideration to all the elements of value recognized by the law of the land for rate-making purposes.

These provisions seemed to place the responsibility upon the commission for the initiation and establishment of adequate and reasonable rates, whereas this had previously been left to the railroads. The law was more liberal also in that rates should be sufficient to insure increased transportation facilities, whereas, formerly, only rates barely escaping the charge of confiscation were permitted.

The commission organized the country into four groups, namely, the eastern, southern, western, and mountain Pacific. It set the property valuation at \$18,900,000,000, upon which it was to allow a return of 6 per cent, including one-half of 1 per cent for improvements. Rates were advanced 40 per cent in the eastern group, 25 per cent in the southern, 35 per cent in the western, and 25 per cent in the mountain Pacific, $33\frac{1}{3}$ per cent on inter-group traffic, 20 per cent in passenger fares and miscellaneous carriage, a surcharge of 50 per cent in sleeping and parlor cars, and increased charges for switching and other services. These increases were to apply to intrastate traffic (amounting to about 20 per cent of total freight and 50 per cent of passenger receipts) as well as to interstate traffic and this order was upheld by the Supreme Court.² But the order failed to produce the expected revenue mainly because of the depression of 1920-1921 and drop in volume of traffic. In 1921 and 1922, through the influence of the commission, rates on livestock were reduced 20 per cent and on most farm products 10 per cent. Soon thereafter a horizontal

¹ WILLIAM J. CUNNINGHAM, *American Railroads Government Control and Reconstruction Policies*, p. 223.

² Wisconsin Passenger Fares case, 257 U. S. 563-591.

reduction of 10 per cent on practically all commodities was decided upon. These reductions were calculated to produce a net return of $5\frac{3}{4}$ per cent on property values.

Yet, as favorable as these provisions appear on the surface, they do not *guarantee* anything either in the aggregate, by groups, or individually. Railroads have no recourse to the government treasury or otherwise in case the commission fails to follow the prescribed course. In fact, results have been far below the return specified in the act or subsequently established by the commission and have been a grievous disappointment to both the railroads and their security holders while railroad credit has suffered greatly.

The act provided that any road earning in excess of 6 per cent on its property valuation should surrender one-half of the excess to the Interstate Commerce Commission, while the other half retained by the railroad was to be used to build up a reserve fund, equal to 5 per cent of its property valuation, for the payment of interest, rentals on leased lines, and dividends in case of necessity. Earnings in addition to the reserve fund may be employed for any lawful purpose. Funds paid into the commission under this recapture provision are to be used as a contingent revolving fund in assisting needy roads to meet the transportation needs of the public and may be used for capital expenditure or to refund maturing obligations originally issued for capital account. At the beginning of 1932 the contingent fund amounted to \$13,277,598, of which \$10,717,922 represented payments and the balance interest accumulations. The total amount due under the recapture provisions has been officially estimated at \$361,465,815. Seven coal roads accounted for 34 per cent of this.

The Act of 1920 gave the commission the power to fix minimum rates in addition to maximum rates and hence it acquired the power to establish exact rates for the first time in its history. This prevents railroads from engaging in competitive and destructive rate wars between large points among themselves and with water routes.

The act disposes of the conflict between state and federal governments in favor of the latter as to intrastate rates which discriminate against interstate commerce. This prevents a state from fixing a rate between points wholly within the state which would operate unfavorably to points just across state lines which had to accept rates made by the commission and places jurisdiction with the Interstate Commerce Commission.

Finally, the period for which the commission could suspend rates was reduced from 10 to 5 months, after which the increased rate goes into effect in case no decision has been reached by the commission. The commission may, however, later decide adversely to the railroad, whereupon a refund of the excessive rates with interest may be ordered.

Consolidation.—The Act of 1920 permits competing roads to consolidate in the public interest by control of one road over another, by lease or stock ownership, and the pooling of traffic and earnings provided "competition shall be preserved as fully as possible, and wherever practicable the existing routes and channels of trade and commerce shall be maintained." The commission was required to prepare and adopt a plan whereby the railroads of the country were to be consolidated into a limited number of systems. Consolidations thus brought about are exempt from the operation of all state and federal anti-trust laws.

It was contemplated that a grouping of all railroads, so that each group would form a unified system including both the strong and weak, would simplify rate-making. In the meantime the recapture provision was included in the act to assist the weaker roads. The commission (with the assistance of Professor Ripley) worked out a tentative plan of consolidation in 1921 embracing altogether 19 systems. But so many objections arose in the course of the hearings that the commission practically shelved the entire matter.

Several reasons may be assigned for the failure of the plan. In the first place, the commission was given no mandatory power to compel consolidation. Voluntary consolidation may not be expected to induce strong roads to take over weak ones where the weak ones would be a hindrance to future development. Voluntary consolidation would not always preserve competition as required by the Act of 1920. In the second place, the act requires that consolidations be in accordance with the plan of the commission whose final plan has never been adopted. The act also required that the securities issued be not in excess of the value of the consolidated properties. As has been shown, the valuation figures of the Interstate Commerce Commission were upset by the O'Fallon decision.

Other Methods of Combination.—The act used the term "consolidation" in the sense of a merger of various companies into a single corporation. But it provided for other means of combination without complete consolidation. It also permits combination through stock ownership or lease. A considerable number of combinations have taken place under this provision, while some have been rejected. Combinations which are purely intrastate in character fall without the purview of the commission.¹

Under these provisions some notable combinations have taken place. Worthy of special mention are acquisition of control over properties by the Missouri Pacific, the Southern Pacific, and the Illinois Central. The commission has refused a number of important plans for combination. Among these the outstanding example is the Nickel Plate merger which involved the Chesapeake and Ohio, the Hocking Valley, the Erie, the

Pere Marquette, and the New York, Chicago, and St. Louis, also the Norfolk and Western was denied control over the Virginian Railway, the Kansas City Southern was denied control over the Missouri, Kansas, and Texas and the St. Louis Southwestern. These refusals were on the grounds that there was no substantial public advantage, that certain weak roads were omitted, and that unfair treatment to minority stock interests would result.

Eastern Trunk Lines.—A plan for the consolidation of certain eastern roads into four major systems with service to Chicago materialized in 1931. It was the product of the railroads and differs materially from that presented in 1929 by the commission. It involves 43,000 miles of line, an investment of approximately \$10,000,000,000, and the roads represented carry a still larger proportion of the total freight tonnage of the United States. Under this plan the Pennsylvania emerges as the outstanding system in size. Its acquisitions were the Wabash, the Norfolk, and Western, and the Detroit, Toledo and Ironton, all of which were previously owned or controlled by the Pennsylvania Railroad. The New York Central comes next in size and contemplates the addition of the Delaware, Lackawana, and Western, and the Ulster and Delaware, in both of which it already held a substantial interest. Third in size comes the new group of the Van Sweringens embracing the Chesapeake and Ohio, the New York, Chicago, and St. Louis, the Pere Marquette, the Erie, the Lehigh Valley,¹ the Chicago and Eastern Illinois, and some smaller roads. The Baltimore and Ohio, with the addition of the Chicago and Alton and the Buffalo, Rochester and Pittsburgh (both previously controlled by the Baltimore and Ohio), to which was added the Philadelphia and Reading, the Central Railroad of New Jersey, (both previously controlled by the New York Central), the Ann Arbor, and the Western Maryland which was already a part of the Baltimore and Ohio formed a fourth system. A fifth system suggested by the commission, with the Wabash as the nucleus, did not materialize in the plan.

Labor Problems.—The Act of 1920 authorized the establishment of labor boards of adjustment by agreement between the employees and the railroads to have jurisdiction over grievances, rules, or working conditions. Only a few of these were organized before 1924, owing to the fact that the railroads desired local boards while the employees held out for national organizations.

However, the act required the establishment of a railroad labor board composed of nine members appointed by the president. This board was to serve in the absence of a board of the first type or on appeal from the decision of this board, but its main duty was to settle wage and salary disputes and to investigate labor conditions and publish information

¹ Formerly controlled by the Pennsylvania system.

relative thereto The board had no power to enforce its decisions and no penalties were provided

Immediately after its establishment, the labor board was called upon to settle the "unauthorized" strikes of the switchmen and others Upon the principle of providing a decent standard of living and education for the children, it allowed a 22 per cent increase in wages affecting 2,000,000 employees and added \$618,000,000 annually to the labor bill of the railroads It also settled disputes relative to working conditions and these decisions were greatly to the advantage of the employees, although not without some benefit to the railroads. Owing to the depression in 1921, the board reduced wages about 12 per cent, \$400,000,000 annually, leaving the wage level about 7 per cent higher than it was under federal control. In 1922, following rate reductions, it practically restored the wage scale in force prior to the advances in 1920 This was followed by the disastrous shopmen's strike, the men refusing to accept the reduction After prolonged wrangling, the shopmen failed to retain the wage advances and in addition lost much time and many of the men their seniority On the other hand, the strike was costly to the railroads

The railroad labor board was unsatisfactory to all parties Its partisan character (being composed of three members representing the employees, three from the railroads, and three from the public) biased its actions from the beginning.

Railway Labor Act of 1926—This act abolished the labor board and provided for the adjustment of labor troubles by the employers and employees with only a modicum of government intervention The main provision of the act is for a board of mediation to be composed of five members appointed by the President of the United States This board is to settle all matters which cannot be disposed of by conferences and boards of adjustment provided for in the act between employers and employees alone Failing in this, it becomes the duty of the board of mediation to induce the parties to arbitrate according to the usual scheme of representation on the board of the two parties to the dispute who choose a third member. If all these fail, the President is authorized to appoint an investigating board which is to report its findings within 30 days and to make the same public A considerable number of cases have been settled by the board of mediation and quite a few by arbitration The difficulty here as in all such cases is to secure impartial members of the various boards

Securities.—Exclusive control of railroad securities was obtained for the first time in 1920 No railroad can legally issue securities or assume liability therefor (except notes of 2 years or less maturity if under 5 per cent of the total securities of the road) without the consent of the commission The roads are required to report the method of disposing of the securities and how the funds have been applied.

Failure to comply with this renders the issues void and subjects the railroads and officers of the company to penalties in favor of the security holders who have acquired the securities in good faith and makes the officers liable to imprisonment. These provisions effectively eliminate financial free-booting and high practices that in times past have so reflected upon the credit of all railroads—the innocent as well as the guilty.

The Hoch-Smith Resolution—A new factor in rate regulation appeared in 1925 with the passage of the Hoch-Smith resolution. The main provisions of this act are as follows: (1) A "true policy" in rate-making is laid down: "The conditions which at any given time prevail in our several industries should be considered in so far as it is legally possible to do so, to the end that commodities may freely move." (2) The Interstate Commerce Commission is required to make a comprehensive investigation of freight rates for the purpose of adjustment in case discriminatory or preferential rates are discovered. (3) Adjustments following this investigation are to be made with consideration partly of "the general and comparative levels in market value of the various classes and kinds of commodities as indicated over a reasonable period of years." (4) Special command is given to adjust the rates on agricultural commodities and livestock to "the lowest possible lawful rates compatible with the maintenance of adequate transportation service."

The provision dealing with adjustment of rates with reference to market value has from time out of mind been a principle of rate-making and adds nothing new, but the provision requiring adjustment to suit the financial condition of an industry is new. The constitutional limitation upon the exercise of this provision probably will limit its operation to reductions in rates to the point of confiscation below which it cannot legally go. "Rates that we may lawfully require must in principle be high enough to cover all the cost that may fairly be allocated to the service plus at least some margin of profit."¹ Again, rates shall be adjusted with reference "to the maintenance of an adequate system of transportation" and should be "compatible with the maintenance of adequate transportation service." It apparently was not the intention to ignore transportation costs in fixing rates, but in the case of agricultural commodities the commission interpreted the resolution to mean that such products should be placed in the most favored class.² However, this resolution has borne fruit in rate-making. It has stood in the way of increases in freight rates which the commission acknowledged were inadequate and has actually brought about reductions, as in the California fruit rates and the 5 per cent increase on agricultural products requested by carriers of the western district on the ground of inadequate return on

¹ I C C 617

² 122 I C C 235, 264

the value of the property. In the latter case denial was on the ground that no emergency existed and the transportation facilities would not suffer if not granted¹ It has prevented, or at least has been used as an argument against, horizontal increases in rates for fear of elevating some classes higher than conditions in the industry would seem to warrant² Horizontal rate increases may be made apparently only when an "emergency" exists This is a lower standard from that contemplated in the Act of 1920 and inimical to a rate sufficient to allow a reasonable return on the property

The O'Fallon Decision.—This case was brought up under the recapture provisions of the Transportation Act of 1920 It involved the determination of what constituted earnings in excess of 6 per cent during the years 1920 (10 months), 1921, 1922, and 1923.

In arriving at the value of the O'Fallon property during the recapture period, the commission proceeded as follows. On property installed prior to June 30, 1914, reproduction costs as of that date were used, it being impossible from the records of the railroad to ascertain actual or original costs prior to that time The commission was of the opinion that 1914 prices represented the average prices for possibly 20 years past. On property installed from 1914 to 1919 unit prices of 1914 plus price increases during the period were used, on property installed since that time actual costs were used On all property constructed prior to 1919 depreciation of 25 per cent was deducted (but none on that constructed after 1919) The sum of the values thus determined, added to the current value of the land, an amount for materials and supplies (but nothing for cash), and a flat amount equal to 5 per cent of property investment constituted the value of the property for rate-making purposes The commission employed three different bases for valuation covering three portions of the property, depending upon the time of installation This resulted in reproduction cost as of 1914 for the major portion of the property, reproduction cost of property installed from 1914 to 1919 as determined by their scale of the price level, and actual cost of property installed since 1919 The commission thus failed to follow the court's dictum of requiring *present* reproduction cost for the entire property.

In the words of the court,

In the exercise of its proper function this Court has declared the law of the land concerning valuation for rate-making purposes The Commission disregarded the approved rule and has thereby failed to discharge the definite duty imposed by Congress . . . The Question on which the Commission divided is this When seeking to ascertain the value of railroad property for recapture purposes, must it give consideration to current, or reproduction costs? The

¹ Article by K F BURGESS, *Harvard Business Review*, October, 1929

² 113 I C C 3, 39

weight to be accorded thereto is not the matter before us. No doubt there are some, perhaps many railroads, the ultimate value of which should be placed far below the sum necessary for reproduction. But Congress had directed that values shall be fixed upon a consideration of present costs along with other pertinent facts, and this mandate must be obeyed.

Results of the O'Fallon Decision—This decision added nothing new to the principles of valuation. It does make it imperative, however, that the Interstate Commerce Commission adjust its method of valuation to conform to the court rule. It might also be inferred that reproduction cost should be the starting point in valuation but this is a matter of pure speculation, since the court does not go beyond the statement of the principle involved. But not all judges are in agreement with the latest decision, three having dissented and a fourth refrained from taking any part in the decision. The decision itself was a reversal of a decision of a lower federal court. Evidently the future of the valuation is dependent largely on the personnel of the Supreme Court.

The commission reported in the O'Fallon case that it knew of no way of giving weight to the factor of cost of reproduction "not dependent upon caprice, unless full weight be given under the current reproduction cost doctrine." However, the distinction between present value and cost of reproduction may well be borne in mind when criticising the position of the Supreme Court. Mr. Justice Brandeis in his dissenting opinion says, "to prove actual value by evidence of reproduction cost, the evidence must be directed to the present cost of installing such a plant as would be required to produce the same service." Thus obsolescent plants and equipment would be heavily discounted in determining present value. Likewise, this judge calls attention to construction costs of property on war prices and whose earning power is deficient because of changed conditions, property is regularly being abandoned whose economic service has ceased to exist. Owing to recent changes, much railroad property no longer serves the purpose of transportation. The cost of reconstructing the identical property thus becomes economically impossible, and hence absurd, as a rate base.¹

Rate of Return.—In the earlier period of railroad regulation the doctrine of reasonable rates had been applied in the interest of the shipper alone. But the railroads soon took advantage of the principle and began to demand that rates be reasonable in the sense of a just compensation for the use of their property in the interest of the public as guaranteed by the Federal Constitution. From the point of view of the capital investment, this has remained the guiding principle in determining the general level of rates. But the commission was obviously handicapped in the application of the principle as long as there was no acceptable factual basis for property values. The Act of 1920 provided that for 2 years (till

¹ See article by W. M. Daniels in *Harvard Business Review*, October, 1929.

March 1, 1922) a return of $5\frac{1}{2}$ per cent per annum and in addition at the discretion of the commission an additional amount of one-half of 1 per cent for improvements, betterments, and equipment. The commission arrived at the conclusion that beginning March 1, 1922, a "fair return on the aggregate value of the railway property of the carriers will be 5.75 per cent of such aggregate property value as a uniform percentage for all rate groups or territories designated by this Commission."¹

Operating costs of the railroads during the period of post-war inflation, and while still under federal control, had enormously increased without any corresponding increase in transportation rates. The commission authorized increases in rates calculated to add \$1,500,000,000 to revenues. But the depression of 1920 and 1921 resulted in a marked decline in traffic and appeal for wage reductions was made. The board granted the reductions (already noticed), averaging 12 per cent, in June, 1921. Owing to the severe deflation of commodity prices, the public demanded reduction in freight rates. This demand was met by many reductions, including a 10 per cent reduction on all agricultural products. Application for a further reduction in wages of 10 per cent was calculated to wipe out all of the advances of 1920. The board allowed considerable reductions in 1922 under this appeal. Since 1923, agreements between the roads and the employees have resulted in numerous increases in wages. The net return to the railroads on their property under the Act of 1920 and subsequent legislation (omitting the year 1920 when the return was only 0.09 per cent) has been as follows:

Year	Per Cent	Year	Per Cent
1921	2.84	1927	4.29
1922	3.58	1928	4.64
1923	4.33	1929	4.84
1924	4.21	1930	3.30
1925	4.74	1931	1.98
1926	4.98		

Railroad Credit.—The return allowed by the commission, 5.75 per cent on property valuation, is little more than a statement of policy and at best an ideal to strive for. It should in no sense be regarded as a guarantee. While under this policy most railroads have fallen far short of attaining the ideal set, others have prospered and have been presumably subject to the recapture provisions of the Act of 1920. Railroad credit as a whole is in need of being strengthened. But railroad credit in the last analysis must be based upon the ability of the carriers to attract new capital in competition with other demands in a highly sensitive market. Here lies the heart of the entire problem of railroad credit and transportation facilities. If, after almost two decades of investigation

¹ Quoted from a rate decision given in *Commercial and Financial Chronicle*, May 27, 1922, p. 2327.

and study, the Interstate Commerce Commission can find no water in railroad capitalization as a whole, the problem for the future would seem to be reduced to comparatively simple terms, namely, the allowance of a rate sufficiently high to attract investment funds of the country in amounts large enough to supply the needs of the railroads in competition with the demand for capital from other sources

This principle was recognized by the commission when it said, concerning the Transportation Act of 1920 "The intent of Congress was to create a steady and reliable flow of money for enlarging such facilities in order to provide the people of the United States with adequate transportation" And again,

Most of the capital will have to be acquired through the issuance of securities which must be sold in the markets of the world in competition with other classes of securities The carriers must attract money by rates of return and stability of investment While return must not exceed a reasonable charge against the public served, it must be such as to obtain the needed new capital ¹

One might then conclude that a fair rate of return demanded by the Supreme Court is one that will be fair to investors and shippers alike It will produce sufficient revenue to protect the investor in the capital markets of the world and to provide for the increasing facilities demanded by the public in its transportation requirements ² Viewed concretely, such a rate has no reference *per se* to the amount of invested capital treated as a whole Capital is raised through the flotation of bonds and stocks. Standard margins recognized to be necessary in the customary issuing of securities of these types must be recognized Bonds and stocks must be promised a return on the money invested in them adequate to the risk involved and in conformity with the market requirements at the time of issue. In the past the nominal rate on railroad bonds has ranged generally between 3½ to 6 per cent, depending upon the grade of security issued and the state of the current investment market The yield on stocks is more uncertain, since future prospects are a large factor in attracting capital to these issues

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¹ In *Reduced Rates*, 1922, 68 I.C.C. 676, 681

² Compare the statement of the Railroad Securities Commission of 1911 when it said a fair rate of return is "one which under honest accounting and responsible management will attract the amount of investors' money needed for the development of our railroad facilities"—p. 34 of the *Report*

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CHAPTER XVII

FINANCIAL ANALYSIS OF RAILROADS

For convenience of treatment, certain principles of fundamental importance to the income and asset phases of credit are grouped under financial analysis. Underlying the financial situation of railroads are general traffic conditions, layout of plant and equipment, and physical operating efficiency. These form the natural approach to financial analysis.

Traffic.—The past decade has brought significant changes in railroad traffic. As measured by gross receipts in the first decade of the nineteenth century, traffic was roughly composed of approximately three-fourths freight, about 23 per cent passenger, and the balance mail and express. These proportions began to change prior to the war but have changed very rapidly since 1920. In 1910 freight receipts were 72 per cent of the total, passenger receipts 24 per cent, while mail, express, and miscellaneous items made up the balance, in 1920 freight traffic accounted for 74 per cent, and passenger 22 per cent, while in 1930 freight had advanced to 76.7 per cent, passenger had dropped to 13.5 per cent, and all other items amounted to 9.8 per cent. Thus, more and more, freight is coming to be the mainstay of the railroads, while revenues from switching, dining cars, hotels, restaurants, and other sources connected with regular transportation service are assuming considerable importance.

Changes in the character of freight traffic are equally marked and significant. The following data show the composition and trend in freight tonnage since 1910 according to commission figures:

TABLE 31 —FREIGHT TONNAGE SINCE 1910

Type of traffic	1910, per cent	1920, per cent	1930, per cent
Products of agriculture	8.13	8.62	9.40
Animals and produce	2.10	2.27	1.93
Products of mines	56.23	56.58	55.67
Products of forest	11.67	8.67	6.60
Manufactures and miscellaneous	18.18	19.73	23.84
Less-than-carload	3.69	4.13	2.56
	100.00	100.00	100.00

The decline in percentage of products of mines, forests, and less-than-carload merchandise and the increase in manufactures and miscellaneous

and products of agriculture are significant. The bulky products made up of the first four classes of the table carry low freight rates and their total percentage has declined from 78.13 in 1910 to 76.14 in 1920, and to 73.60 in 1930, the more valuable and higher-rate freight has shown an increase from 21.87 per cent in 1910 to 23.86 per cent in 1920, and to 26.36 per cent in 1930. Thus railroad traffic as a whole is becoming better diversified and the higher-rate classifications have made good gains. Most of the increase in almost all carloadings in the past decade came from manufactured goods, most petroleum products, and automobiles, less-than-carload freight decreased from 53,000,000 tons in 1920 to 36,000,000 in 1929, on the other hand, coal traffic decreased while gravel, sand, and stone increased.

While these percentages may be taken as the type for the country as a whole, the position of the individual railroad may be very different. Some large systems, the New York Central for example, conform roughly to this pattern but this is not generally characteristic of either the larger systems or the smaller roads of the country. In fact railroads with logic have been classified according to the predominance of certain kinds of traffic. For instance, the Chesapeake and Ohio, the Baltimore and Ohio, and the Norfolk and Western are known as coal roads, each showing a predominance of coal in its traffic. With much less justification, roads of the South have been known as cotton roads and those of the West as granger roads. Roads west of the Alleghenies ordinarily show a much better diversification of traffic than those of the eastern seaboard. Table

TABLE 32—DIVERSIFICATION OF FREIGHT IN LEADING RAILROADS
(Year ending December 31, 1929)

Railroad	Agriculture	Animals	Mines	Forests	Manufactures and miscellaneous	LCL freight
Union Pacific ..	27.32	4.36	30.22	14.64	21.29	2.17
New Haven	9.1	2.8	33.5	4.2	42.4	8.0
Milwaukee	13.9	4.9	37.2	14.9	26.2	2.9
Pennsylvania ..	4.62	0.89	60.71	3.47	27.90	2.41
Baltimore & Ohio	3.87	1.19	61.02	4.17	27.86	1.89
Southern . .	10.11	1.00	42.74	15.55	24.99	5.61
Missouri Pacific	17.76	2.49	41.00	12.88	24.52	1.95
Great Northern	14.11	1.38	63.33	9.67	11.51*	
Erie	6.04	2.07	55.03	2.78	31.92	2.16
New York Central	5.80	2.17	57.98	2.88	27.89	3.28
Atchafson	22.84	3.16	35.98	5.33	30.12	2.57
Chicago & Northwestern	12.58	4.54	46.40	10.78	22.30	3.40
Norfolk & Western	2.00	0.30	84.79	3.47	8.13	1.31
Bangor & Aroostook	34.81	0.15	11.52	23.94	27.35	2.23

* Includes LCL freight
Poor's Manual, 1930

32 on page 310 shows the diversification of traffic in selected systems of the country. In this list the Union Pacific, the Atchison, the Milwaukee, the Southern, Missouri Pacific, the Northwestern, and Bangor and Aroostook rank highest in diversification of traffic, while the Norfolk and Southern show exceptional concentration in freight from the mines. Even the New York Central and Pennsylvania suffer in comparison with the leading western roads.

Passenger Traffic.—Passenger traffic has fallen off at an alarming rate during the past decade. Roughly speaking, the actual number of passengers had decreased about one-third. Between 1923 and 1929, only commutation passengers held their place, Pullman passengers showed a moderate decrease, while all others showed a decline of 41 per cent. Nevertheless Pullman, sleeping, dining, and observation car-miles increased 36 per cent in the period, probably the result of competition. Passenger traffic has probably ceased to be profitable for practically all trains except those of high-class service.

Traffic Origin.—Railroads originating their own traffic have an advantage over those depending upon connections with other railroads or ocean transportation lines at terminal points. A railroad traversing territory rich in natural resources or well developed industrially and commercially is indispensable to the territory served and is independent of other roads. The very existence of the territory itself is conditioned upon adequate transportation. In this respect the coal roads of the eastern seaboard rank high as also do most of the granger roads of the Middle West. On the other hand, through routes and trunk lines connecting the larger points are likely to be affected with severe competition. Among strongly competitive roads are the Pacific lines to the Northwest, the transcontinental roads to California as also the Boston and Albany and New Haven for New England traffic. The New York Central originates less than one-half of its traffic, the New Haven about one-third, and Chesapeake and Ohio over three-fourths. Some strongly competitive roads, notably the Union Pacific, have sought to strengthen their position by traffic agreements and stock ownership in connecting lines. These roads maintain their lead in traffic largely through these connections, directness of routes, and superiority of service.

Permanence of Traffic.—From the long-period outlook, permanence is of decided importance. Roads originating large portions of their traffic may be vulnerable on account of its temporary character. This is particularly noticeable in the case of oil, mine, and lumber territory, where exhaustion is a perennial danger. Sudden development of traffic which is destined to be short lived may create an entirely false appearance of prosperity, only to be followed by collapse in revenues when the resources are exhausted. Perhaps the most permanent and localized of all traffic has been that originating on the farms of the country. Efforts

of railroads in the past to build up new territory through immigration and colonization, as well as more recent efforts to build up commercial and industrial activities, have resulted in the enhancement of their own position

Average Haul—The average haul of railroads is important because rates are adjusted approximately according to the distance hauled. Roads with long hauls are in a better position than those with short hauls because of the expenses of handling freight at terminal points. The average haul has increased markedly during the past 20 years. In 1908 the average haul for the railroads of the country was only 143 miles for each ton of freight, this increased to 169 in 1918, to 179 in 1928, and to 181 in 1930. The lowest average haul in 1928 was in New England with only 119 miles per ton of freight, the highest was 314 in the north Rocky Mountain region. The average haul increases as one traverses the territory from the eastern seaboard to the Rocky Mountain and Southern districts. Passenger traffic shows a similar trend. In 1908 the average distance per passenger was 32 miles but advanced to 40 in 1928.

Traffic Density.—One of the best indications of railroad prosperity is traffic density. For freight this represents the tons of freight hauled 1 mile divided by the number of miles of road. It represents the intensity of usage of the railway plant and the greater the traffic density, the greater the receipts in proportion to the capital investment (assuming similar conditions in other respects). Freight density has shown a rapid increase within the past 20 years. In 1908 it was 949,485 but in 1928 it stood at 1,738,524. Freight-traffic density varied in 1928 from 3,553,000 in the Middle Atlantic states to 1,075,000 for the states of the Pacific Coast. Density of passenger traffic is measured by the number of passengers traveling 1 mile per mile of road. Passenger density increased from 104,707 in 1908 to 172,040 in 1918 but fell to 126,200 in 1928.

Freight- and passenger-traffic density, the average haul for freight, and the average distance traveled by each passenger are given in the compilation shown on page 313.

In freight-traffic density the Norfolk and Western, the Erie, the Baltimore and Ohio, the Pennsylvania, and the New York Central rank high while the poorest showing is made by the Bangor and Aroostook, the Northwestern, the Milwaukee, the Southern, and the Great Northern. Great variations are found in the average haul ranging from 126.71 miles in the New Haven to 398.09 in the Union Pacific. In general the eastern roads have the advantage in traffic density while the western roads excel in average haul. The Norfolk and Western is preeminent for its high position in both respects, while of the larger systems the Pennsylvania, the New York Central, and the Baltimore and Ohio are in the most

TABLE 33—TRAFFIC STATISTICS FOR LEADING SYSTEMS
(Year ending December 31, 1929)

Railroad	Miles operated	Miles additional main track	Miles track and siding	Freight-traffic density	Average haul	Passenger density	Average journey per passenger
Union Pacific	9,898	1,557	4,102	1,402	398.09	90,629	296.05
Atchison	13,157	1,847	6,048	1,304	325.41	97,591	291.63
New Haven	2,133	1,100	1,873	1,824	126.71	984,223	30.55
Milwaukee	11,247	1,295	4,319	1,164	250.85	54,206	76.89
New York Central	6,915	17,167*		3,352	195.13	533,469	44.86
Pennsylvania	10,511			4,660	210.17	380,735	37.04
Northwestern	8,458	5,198		1,051	150.29	112,631	34.14
Baltimore & Ohio	5,666			3,722	190.22	140,485	80.16
Erie	2,315	1,435		4,050	205.04	261,058	21.90
Southern	6,730			1,240	187.40	98,470	104.08
Missouri Pacific	7,451	385	2,604	1,481	243.91	55,956	105.13
Great Northern	8,367			1,214	255.94	46,681	161.67
Norfolk & Western	2,224	639	1,052	7,468	280.18	67,652	63.00
Bangor & Aroostook	613			513	129.69	22,249	42.09

* Includes track and siding
Compiled from *Poor's Manual*

favorable position. The Bangor and Aroostook grades low in both respects.

In passenger density the New York Central, the Pennsylvania, and the Erie are far ahead of the other systems. The western roads with their long mileage make a poor showing when compared with the roads traversing densely populated sections of the East. But in average distance traveled by each passenger the western transcontinental roads are immeasurably in advance of the eastern roads. The Union Pacific and the Atchison are far in the lead of all other roads of the country, approximately 300 miles each, while the poorest showing is made by the Erie, the Northwestern, the Pennsylvania, and the New York Central.

Plant Situation.—The physical plant of a railroad is of commanding importance in several respects. Here should be taken into account the mileage, extra and auxiliary track, terminal facilities, grades, curves, and equipment. Railroad mileage refers to the distance covered between points and does not take into account second, third, or fourth track, or sidings, switches, and terminal tracks. Railroad mileage is important as an index to the degree of stability of earnings. Roads showing extensive mileage, penetrating a large area and normally including many cities and towns in their service, generally show much greater diversity of tonnage than roads with shorter mileage. In case the mileage is made up largely of long distances between important points, the road gets the advantage of the long hauls and thus gains in stability of traffic and

earnings Some of the transcontinental roads, such as the Atchison and the Union Pacific, gain a tremendous advantage over roads with no important terminals Closely connected with mileage is the matter of terminal facilities. No road is really efficient that does not possess its own terminal facilities, or that does not have access to such facilities to the degree that will avoid delays in loading and unloading From the purely business point of view also, convenient terminals are absolutely necessary in the competitive race for traffic

Much railway mileage and property have been rendered unprofitable during the past decade Motor vehicles have captured a large portion of local traffic, rendering the capital invested in roadbeds and stations unprofitable Something like 8,000 miles of track have been abandoned since 1920 It has been calculated that one-half of the railroad business of the country is done on 10 per cent of the mileage and of the other half 48 per cent is done on 60 per cent of the mileage, only 2 per cent of total business is done on the remaining 30 per cent of the mileage Abandonment of 30 per cent of the mileage would be advantageous to railroads

Extra Track.—When a railroad finds itself in the position of reduced efficiency in handling traffic on account of congestion of trains, it becomes imperative to add extra track if it is to maintain its operating efficiency All roads with dense traffic could greatly increase their operating efficiency and safety to the public by adding extra track But whether this would pay from the standpoint of increasing net revenues is not apparent on the surface and can be decided only upon careful calculation of the capital investment required in each case The additional capacity to handle traffic on account of double track is probably 30 to 50 per cent but in no case will double track enable a road to double its ability to handle traffic The peer of extra-track systems is the New York Central with 6,915 miles of road and 17,167 miles of extra track In this connection should also be mentioned the New Haven, the Union Pacific, and the Northwestern whose main lines are double-tracked for practically their entire distance Most of the trunk lines of the country are rapidly being double-tracked, which accounts for the expenditure of considerable portions of new capital investments Improvement in operating efficiency doubtless is possible through additional extra track on roads like the Erie and the Norfolk and Western with traffic density higher than that of the New York Central and with much less extra track in proportion to mileage Yet due allowance must be made here for the character of the traffic. The coal and iron roads show dense traffic on account of the weight of the commodities, but they show less trains than roads carrying lighter traffic, in the end it is the operation of trains that is the essential matter

Grades and Curves.—Of hardly less importance are the grades and curves of railroads Numerous curves and grades make effective oper-

ation difficult. Speed will invariably be reduced and tractive power of locomotives must be great to surmount the difficulties of steep grades. Expenses will invariably rise on roads having these defects. In the East the New York Central is far superior to the Pennsylvania, the Erie and the Baltimore and Ohio, while in the transcontinental territory the Union Pacific has great advantages over its competitors in directness of route and easy passage over the mountains. High operating expenses of the Denver and Rio Grande are attributable largely to steep grades and sharp curves.

Equipment—Marked tendency toward improvement in equipment is revealed by statistics for roads of the United States as a whole. The number of locomotives in service reached a maximum in 1924, when 67,441 were in use. Since that time there has been a loss in the number, which stood at 57,807 at the beginning of 1931. But owing to the increase in the average tractive power per locomotive, total tractive power has increased from 1910 to 1930 by two-thirds. Many old and obsolete locomotives have recently been replaced by larger and more modern engines. Changes almost as profound have also taken place in freight cars since 1911. While there were only about 9 per cent more in service in 1930 than in 1910, the average car capacity increased 30 per cent, and total capacity almost 41 per cent. Approximately one-half of the new capital expenditures within the past decade have been for improved type of equipment. In the same period railroads have retired annually over 2,800 out-of-date locomotives, over 125,000 freight cars of obsolete type or otherwise unfit for service, and almost two-thirds of their wooden passenger cars. Never has there been such a record of improvement in railway equipment. With the introduction of heavier equipment has come also the remaking of tracks and bridges to support heavier and longer trains. Already in 1922, 40,000 miles of track were laid with rails weighing over 100 pounds per yard, but in 1927 almost 67,000 miles were laid with this weight of rails. In 1927 over 10,000 miles of track were laid with rails of over 130 pounds per yard compared with only 3,300 miles in 1922.

Operating Efficiency—In 1923 railroad executives agreed upon a plan for improving the efficiency of operation. The physical conditions outlined above were the foundation upon which greater efficiency was based. Certain indexes for the measurement of the results of operation have become recognized as the most valuable in this test. Practically all of them show marked improvement in operating results during the past 10 years. Brief consideration of each of these will be given.

Freight-car Performance.—From the point of view of the shipper, the outstanding fact of the past decade has been the freedom from car shortage with its delays and expense which was characteristic of railroad

operation before the war. This has been accomplished in the face of considerable increase in volume of traffic.

An important index of car performance is car-miles per car-day which represents the number of miles each car in use travels each day. This index shows an increase from 22.4 in 1921, to 32.0 in 1928. This remarkable result is not so much the result of actual increase in speed but is attributable to less delay in yards and terminals, in loading and unloading, and in better distribution of cars. This has been accomplished through increase in extra tracks, better locomotives, automatic signals, and better terminal facilities.¹

A more comprehensive composite index of performance is the ton-miles per car-day. This is a combination of carload, miles per car-day, and the percentage loaded of total car-miles. This index shows an increase from 389 in 1921 to 547 in 1929. It is affected by the volume of traffic so that the figure dropped to 469 in 1930.

At the same time the number of tons per loaded car has declined slightly. This is beyond the control of the management, since it reflects purchasing habits under conditions of smaller inventories and more rapid turnover, as well as changes in rates that permit partial carloads to move at carload rates. There has been an even greater decline in percentage of loaded cars, the index falling from 67.2 in 1922 to 63.3 in 1928. This has resulted from the greater utilization of equipment by moving empties continuously to points of need. It reduces the total number of cars needed, thereby lessening the capital investment.

Locomotive Performance—This is measured by the average miles per locomotive-day. Here the total number of locomotives, serviceable and unserviceable, is used and gives the average miles traveled per locomotive-day. This index is affected directly by the volume of traffic. It has shown some tendency to increase since 1923, owing to the increasing length of the locomotive run, better facilities for repair, and factors affecting the operation of trains.

Freight-train Performance.—The net tons of freight per train has shown a tendency to increase since 1921. In that year it was 651 but increased to 793 in 1928. The speed in miles per hour has increased from 11.5 to 12.8. These two factors are combined in tons per train-hour. This index (including weight of train) has increased from 16,555 in 1921 to 23,623 in 1928. It has been found that train expenses vary more with speed than with miles traveled and train-hours have received more attention from management in recent years with the result that expenses have been considerably reduced while the service rendered has improved.

Fuel Consumption.—Railroads have always been the largest single user of coal and this is one of the important items in their total expense.

¹ *Recent Economic Changes*, Vol. I, p. 287.

account. Owing to better locomotives, improvement in roadbed, curves, and grades, expeditious handling of traffic at terminals, and other improvements, the coal consumption per 1,000 gross ton-miles declined from 162 pounds in 1921 to 121 in 1930. Similar improvements have been made in oil consumption where this fuel is used. A similar, though less marked, saving has been made in the passenger service. Translated in terms of dollars, assuming coal to be purchased at \$2.66 per ton, the railroads saved over \$62,000,000 in 1927 over 1921 from this source.¹

Equipment Utilization.—Equipment has been better utilized within the past decade than ever before. The percentage of unserviceable freight cars declined from 13.2 per cent in 1921 to 6.2 per cent in 1928. Unserviceable locomotives declined from 23.4 per cent in 1921 to 16.20 per cent in 1928. This result was brought about, doubtless, from efforts exerted by the management to keep equipment in better repair but also by the heavy discarding of old and obsolete equipment in favor of improved new equipment.

Employment.—The increase in wages of railroad employees has been partly responsible for the progressive reduction of the number employed during the past decade. The average number employed in 1916 was 1,600,000 but reached a maximum under government operation of 2,022,000 in 1920. For 1931 the average dropped to 1,278,000.

A composite unweighted index of operating efficiency prepared by the Bureau of Railway Economics and including nine separate indexes shows an advance from 100 (based on the average of 1920-1924) to 122.3 in 1929. This technical improvement in the operating results of railroads is undoubtedly a great achievement. It reflects credit upon the management and stands as one of the few fulfillments of the high promises of the Transportation Act of 1920.

Income.—We turn now from physical performance to financial results. The Interstate Commerce Commission accounts divide railroad income into operating and non-operating revenues. The operating revenues are subdivided into rail-line transportation, water-line transportation, incidental, and joint facility. The rail-line revenues embrace income from freight, passengers, excess baggage, sleeping car, parlor, and chair car, mail, express, other passenger-train, milk, switching, special service trains, other freight trains, and water transfers. The water-line transportation revenues are derived from freight, passengers, excess baggage, other passenger service, mail, express, special service and others.

Operating Revenues.—The increasing dependence upon freight and miscellaneous revenues has already been noticed. Mail and express revenues together have increased within the past decade. This has resulted from greater volume of traffic and from recent rate advances in these items. Freight revenues have also increased absolutely, owing

¹ *Recent Economic Changes*, Vol. I, p. 290

entirely to increased volume of traffic. Freight rates show considerable reduction since 1921. This has been occasioned by action of the Interstate Commerce Commission and by voluntary action of the railroads themselves as to competitive points to encourage industrial development along their lines. The average revenue per ton-mile of freight has gradually dropped since 1921.

Non-operating Revenues.—While the main source of operating income is from rail and water transportation lines, incidental facilities account for a portion of all operating revenues. These include hotels and restaurants, parcel rooms, demurrage, grain elevators, power, rentals of buildings, dining cars, parlor cars, stock-yards, telegraph and telephone lines, storage plants, and miscellaneous. These activities are usually immediately connected with the railroad and contribute to its general earning capacity. They are sometimes financially self-sustaining but often show deficits. Yet they cannot generally be dispensed with, especially where appeal is to be made to the public for traffic in competition between large points. They are frequently of great advertising value, as for instance, in the restaurant service of the Atchison, the dining-car service of the Northwestern, and so forth. These revenues or deficits, like all others not immediately connected with the railroad as an operating unit, have been separated from other revenues in the accounts of the Interstate Commerce Commission since 1907. Revenues from these sources in 1928 produced \$437,000,000, or 6½ per cent of total income of railroads. The principal non-operating revenues come from dividends on stocks and interest on securities held.

Revenue from stocks and bonds formerly included only that from subsidiary roads acquired in the process of consolidation, but, recently, community of interests and other factors have brought about large holdings between systems not otherwise related in their finances. In 1928 the income from dividends amounted to \$161,391,115 and from interest on funded securities \$70,880,238. Large amounts of revenue are received from this source by many roads. Notable for their intercorporate holdings are the Pennsylvania and the Lake Shore with upward of 40 per cent of their total income from this source; other notable examples are the New York Central, the Illinois Central, the Union Pacific, the New Haven, and so forth. It is apparent that other income must be rigidly separated from operating revenues, if the financial results of operation are to mean anything. The stability and permanence of revenues from these sources must be determined in each case after due examination. Other income itself may be received from roads which own securities in a third road, as in the case of the Lake Shore, which, with over 40 per cent of its total income derived from investments, passes much of it on to the New York Central.

Seasonal Variations.—Seasonal variations are pronounced in railroad traffic and revenues. They reflect seasonal movements in production and trade. The average seasonal variations during the 5-year period 1925–1929 were as follows:

Quarter	Average car loadings, thousands	Annual loadings, per cent of
First	929	23.2
Second	996	24.9
Third	1,070	26.7
Fourth	1,009	25.2

These figures show the third quarter from July to September, inclusive, as the peak while the first quarter, January to March, is the lowest. The first half of the year shows only 48.1 per cent of the annual loadings and the second half 51.9 per cent. The individual roads differ somewhat according to the character of their traffic. The movement of grain and grain products, ore, and miscellaneous items reaches its peak in the third quarter, while livestock marketing is heaviest in the fourth quarter, forest products in the first quarter, and merchandise of less than car lots in the second quarter. Extreme cases of variation are found in the ore traffic of the Great Lakes destined for transshipment by rail. There is an entire stoppage of this traffic during the winter season when navigation is impossible. It has generally been found impossible to adjust seasonal expenses to seasonal traffic, consequently the net revenues of some roads reach the vanishing point during the slack season, while their entire profits depend on the balance of the year's results.

Cyclical Fluctuations.—Cyclical fluctuations are more pronounced than seasonal variations. While the annual variations are serious, shorter periods show still more radical fluctuations. Car loadings dropped from 45,118,000 in 1920 to 39,323,000 in 1921, a decrease of 13½ per cent. By 1922 they had advanced again to 49,812,000. The mild depression years of 1924 and 1927 are plainly visible in car-loading statistics. The depression of 1930–1932 was most disastrous to railroad revenues. Car loadings dropped from 52,827,000 in 1929 to 45,887,000 in 1930, and to 37,272,000 in 1931. Gross revenues dropped from \$6,386,000,000 in 1929 to \$5,355,000,000 in 1930, and to \$4,237,000,000 in 1931. Operating expenses decreased from \$4,561,000,000 in 1929 to \$3,977,000,000 in 1930, and to \$3,266,000,000 in 1931. Net railway operating income shows an even more pronounced decline during these same years. It stood at \$1,275,000,000 in 1929, at \$885,000,000 in 1930, and at \$531,000,000 in 1931. Cyclical variation in employees shows the extent to which railroads attempt to adjust their expenses to decreased traffic. In

August, 1929, total employees numbered 1,759,553, two years later, after retrenchment, the number was only 1,278,000, which involved \$507,000,000 reduction in compensation

Operating Expenses.—Expenses of operation in 1928 as classified by the Interstate Commerce Commission were as follows.

	Per Cent
Maintenance of Way and structure	14
Equipment	19
Traffic	2
Transportation	33
General	3
Miscellaneous	2

The percentage of these items varies according to the circumstances of the individual roads, including the character of the country traversed and the traffic. Maintenance expenditures in a road carrying heavy tonnage, such as the Baltimore and Ohio, runs toward the maximum figure, while roads with lighter traffic are likely to fall near the minimum. In order to determine the trend of maintenance, the figures should be reduced to the mileage basis. Two roads may be compared with each other to advantage only when they traverse similar territory and have similar traffic and terminal facilities. Grotesque results are obtained by wrong methods of comparison. The Virginian Railway, with 90 per cent of its traffic in coal, could not with any propriety be compared with the New Haven, with light freight and large amount of passenger traffic. So, also, roads traversing mountainous regions subject to snow slides and floods have a very uncertain element in maintenance of way. Very much the same considerations apply to maintenance of equipment, since heavy traffic rapidly deteriorates the rolling stock. Maintenance will usually be found to have a direct relation to traffic density. The showing in net earnings depends largely on the maintenance policy of the management. Neglect of maintenance in the past has been a prolific source of failure. Deteriorated property finally reduces carrying capacity to a low point and increases operating expenses through delays and loss of business. Maintenance has frequently been neglected in order that the management may make a good showing in net earnings, while at the same time dividends have been maintained on stock when they were not really earned. Where overcapitalization is found, the temptation to skimp maintenance is especially noticeable. The recent receiverships of the St. Louis and San Francisco, the Missouri, Kansas, and Texas, and others were to no small extent due to run-down equipment and property.

Transportation expenses include all expenditures for the direct operation of trains and embrace the wages of railway trainmen, station men, switchmen, and materials and supplies. They are the largest single item in the list. In spite of higher wages paid trainmen, the tendency of this

item is to form an ever-lessening proportion of total expenses. In 1917 it accounted for approximately 53 per cent of all expenses, but for only 45 per cent in 1928. This is a reflection of the greater per man efficiency in the operation of trains and handling of traffic in general. General expenses are made up of overhead operating items, such as salaries of executives and general administrative offices. Traffic expenses are made up of the cost of getting and maintaining business. Advertising and traffic offices come under this head.

Viewed from another angle, the distribution of the railroad dollar in 1928 as compared with 1916 was as follows:

TABLE 34.—DISTRIBUTION OF THE RAILROAD DOLLAR

Distribution	1916, cents	1928, cents
Labor	38 0	43 0
Locomotive fuel	7 0	5 8
Materials and supplies	15 3	18 1
Loss and damage (injuries to persons, insurance, depreciation, and retirements)	5 3	5 5
Taxes	4 4	6 4
Equipment and joint facility rents	1 1	2 0
Net on railway property investment	28 9	19 2

Especially noticeable is the advance in labor costs of almost 12 per cent due to the elevation of wages during the war period of government operation. First, mention must be made of the Adamson law of 1916 which limited railroad labor hours per day to eight, with increased rate of payment for overtime. This added \$200,000,000 annually to operating expenses. At the end of 1917 came government operation and with it a policy of liberality toward labor. The cumulative effect of the orders of Director General McAdoo for wage increases and wages paid for additions to the force of employees accounted for \$1,000,000,000 increase in operating expenses for 1920. There were also the national agreements with the labor unions for the standardization of wages over the entire country with grotesque results in many localities, and the new classification of employees which lifted the wage scale in many classes. These agreements added \$400,000,000 per year to the payroll. The Labor Board, which was set up by the Transportation Act of 1920, awarded an increase in wages of 22 per cent, which added \$600,000,000 more annually to the payroll. These labor items together amounted to \$2,200,000,000 per annum. The average compensation to employees rose from \$873 in 1916 to \$1,818 in 1920.

Advances in the cost of materials and supplies are accounted for through the higher price level occasioned by the war and inflation, whose

effects have extended down to the present time. The decline in locomotive fuel has been accomplished through greater efficiency in the newer types of locomotives, reduction of curves and grades, better loading facilities, and the like. Even in 1921 it required 162 pounds of coal per 1,000 gross ton-miles, whereas in 1928 it required only 125 pounds. On the other hand, payrolls in 1929 were \$1,428,000,000 larger than in 1916 and \$1,729,000,000 larger than in 1911. Freight rates averaged only 45 per cent higher in 1929 than in 1911, but payrolls were 148 per cent larger. In the early part of 1931 payrolls were running at the rate of \$743,000,000 more than in 1916.

Operating Ratio.—This ratio is of fundamental significance in railroad operation. It represents the percentage of total operating revenues absorbed by operating expenses (excluding taxes) and from the point of view of trend throws a flood of light upon railway finances. It varies with volume of traffic and gross receipts, rates, and operating expenses. In the first 5 years of the present century, it averaged 65 per cent, a decade later it had advanced to 70 per cent, in 1920 it reached 94 per cent; each year from 1920 to 1929 showed a decrease, standing at 71.74 per cent in the last year. The decline since the war is doubtless due to the advance in rates which came in 1922 (although this has been gradually reduced by general reductions and the whittling process), to greater efficiency in operation, to increased volume of traffic, and to decline in commodity prices. The ratio rose again in 1931 to 77.1 per cent.

The operating ratio is likely to be deceptive in practice. If gross operating revenues and net operating expenses increase at the same rate there will, nevertheless, be a larger factor of safety for bond issues. Suppose, for example, on the basis of operating revenues of \$1,000, operating expenses amount to \$700, or 70 per cent. Now let these figures double in amount, making them \$2,000 and \$1,400, respectively. In the first instance only \$300, while in the second \$600, is available for charges. The latter case will result in a much higher factor of safety than the first. This situation is not imaginary, since railroads are subject to the law of increasing returns, of which the example is an illustration. If gross revenues increase faster than operating expenses, the advantage is all the greater, while operating expenses may increase more rapidly than gross and still show a larger factor of safety for bond issues than formerly. The more intensely the railroad system is used, the better off is the investor, even though the operating ratio should remain the same or advance relatively slowly. On the same principle, a road which utilizes its plant to a high degree of capacity cannot be compared with profit with a road of low traffic density. Again, only similarly situated roads may be compared with profit. The operating ratio must always be interpreted with reference to the circumstances surrounding the individual

road. The shorter the interval of time in comparison, the more likely is this ratio to reveal significant facts

The operating ratios of Class I roads in 1928 varied from 62.2 in the Norfolk and Western to 81.5 per cent in the Pittsburgh and Lake Erie. The operating ratio of selected leading systems in 1928 was as follows:

TABLE 35—OPERATING RATIO OF LEADING RAILROADS, 1928

Union Pacific	63.7	Great Northern	65.7
New Haven	68.4	Erie	78.5
Milwaukee	73.4	New York Central	67.2
Pennsylvania	73.8	Atchafalaya	69.2
Baltimore & Ohio	72.9	Chicago & N. W.	76.7
Southern	70.7	Norfolk & Western	62.2
Missouri Pacific	75.3		

The low operating expenses of the Union Pacific are doubtless due largely to a right-of-way with comparatively few curves and grades, and to a double track throughout the distance of the main line. The high ratio of the Erie comes from conditions just the opposite from these. The high operating ratio of the Northwestern is doubtless affected by the large mileage of branch and auxiliary lines.

Taxes—The proportion of the railroad dollar paid in taxes has gradually increased from 4.4 per cent in 1916 to 6.6 per cent in 1930. In 1916 some \$157,000,000 were thus paid. This increased to \$405,000,000 in 1929, an amount approximately equal to the dividends paid on the stock. These taxes are levied chiefly by state and local authorities upon railroad property or income and account for more than three-fourths of all taxes paid. The balance goes to the federal government in income and capital stock taxes.

Net Railway Operating Income.—Under this heading is represented the total operating revenues less operating expenses and taxes, it is the amount available from operating results for fixed charges, dividends, and surplus. This item shows an increase from \$760,000,000 in 1922 to \$1,252,000,000 in 1929. In spite of the provisions of the Transportation Act of 1920, the percentage return on the railway property in every year has fallen below the mark set by the Interstate Commerce Commission. In 1922 it represented only 3.6 per cent return on the investment. The highest ever reached was 5.2 per cent in 1926, in 1929 it was 4.73 per cent but sank to 3.20 per cent in 1930.

Railroad Property as Security.—Railway assets are characterized by the large percentage represented by investments in road and equipment and the small amount in current assets. The economic function of the railroad is to render the service of transportation and this it does by providing adequate machinery for moving men and goods. Materials and supplies on hand are only auxiliary to the operation of the transportation machine and comparatively small in amount. Property investment in

Class I roads on December 31, 1926, amounted to \$23,202,000,000, while materials and supplies were only \$551,000,000 and cash \$535,000,000. Based on reproduction cost at the present time, the value of way and structures was 60 per cent and equipment 40 per cent of road and equipment. The small amount of cash needed is due to the fact that railroad service is rendered for cash either in advance or upon completion of service, thus avoiding troublesome credit problems. On this account, too, a railroad can quickly recuperate its cash balance, provided gross earnings are reasonably well maintained. Looking somewhat more closely at the property items, about 30 per cent of way and structure is accounted for by value of right-of-way, 42 per cent by road construction, 7 per cent by station structures, and the balance, 21 per cent, by tunnels, bridges, shops, tools, and signal apparatus. Equipment costs are made up of 38 per cent locomotives, 50 per cent freight cars, and 12 per cent passenger cars.¹

Railway property as a class is highly specialized and adapted solely to the purpose of rendering the most effective transportation possible. It will retain its value as long as the need for this service remains. But improvements in other forms of local transportation have drained the substance from many local and branch lines and threatened the stability of many longer lines. Through routes for the transportation of weighty commodities, however, seem destined to be the mainstay of railroad property values. As long as the economic need for through transportation remains and if the regulations permit sufficiently high rates and fares, based upon property values, the future of the railroad property is secure. Way and structure of the vanishing road, however, will admit of little salvage value. Even the right-of-way itself is often of little value for other purposes, its value having been destroyed through grading and construction. Urban property, however, may frequently be disposed of at great value. The situation with regard to equipment is far different. Standard-gauge equipment can readily find buyers in other systems and largely for this reason equipment obligations are perhaps the premier corporate securities of railroads.

New Capital Investments—When it comes to ascertain the exact value of railroad property in the United States, one is submerged in a maelstrom of figures, each set representing a particular aspect of the subject. The Interstate Commerce Commission has kept a capital investment account of all railroads since 1907. On December 31, 1928, total investments amounted to \$24,875,000,000 exclusive of materials and supplies and cash, which were over \$1,000,000,000, in the 2 years following \$1,140,000,000 was added for improvements, betterments, and equipment. These figures check approximately with the valuation figures

¹ As estimated by the Bureau of Railway Economics in *Railway Statistics*, p. 91, 1928.

designed for rate-making purposes Under the Act of 1920 the Interstate Commerce Commission set \$18,900,000,000 as the tentative valuation for rate-making Since then, capital expenditures have amounted to about \$6,500,000,000, bringing the total up to \$25,400,000,000, after allowing for the commission's item of depreciation New capital expenditures during the past decade have been about 54 per cent for road and structures, 45 per cent for equipment, and 1 per cent for general expense, with a marked tendency toward greater sums for road improvement, which in recent years has run as high as 75 per cent of the total Practically all of the money spent has gone into improvements and betterments and very little into extensions Freight-train cars accounted for 30.4 per cent in the 6-year period 1922-1927, locomotives 12.3 per cent, passenger cars 5.6 per cent, additional track 15.2 per cent, and heavier rails 4.1 per cent The balance has been invested in yards and sidings, automatic signals, improved ties and ballast, all calculated to make operation more efficient Automatic signals alone have greatly reduced delays between terminals which under ordinary conditions account for 25 to 33 per cent of delays In fact the *raison d'être* for recent improvements has been reduction in operating expenses Although extra track in itself increases operating expenses through the greater maintenance required, the advantage more than offsets this disadvantage

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CHAPTER XVIII

RAILROAD SECURITIES

Financial History.—The local character of early railroads led them to copy the simple financial methods of other types of corporations. Financing was by means of sale of stock alone, the purchaser receiving a certificate of ownership fully paid at \$100 per share. The risks of the new enterprise were borne by the stockholders alone and whatever profits were made were theirs also. The promoters were men of influence in the local community, many of whom owned land or conducted a business which would benefit by the construction of the railroad, so that even if the road itself were not a financial success, enhancement of business or land values amply repaid the efforts and money expended.

Foreign money found an outlet in railroad construction in the United States. In fact, one-half of the capital for the first road, the Camden and Amboy, came from English sources. English bankers, particularly those residing in the South, were much interested, and it is probable that those in other parts of the country were likewise concerned. Some money without doubt came directly from England to help finance this new industry which was also making rapid headway in that country. The clearing of the financial slate of the federal government through the payment of the final instalments of its debt in 1834 established the soundness of American investments abroad. But the panic of 1837 and the period of state debt repudiation which followed abruptly terminated the flow of money from foreign sources, as it also dampened the enthusiasm of investors at home for half a decade.

The appeal for the funds of distant investors unfamiliar with local conditions was responsible for the introduction of the time-honored mortgage into railroad finance. It was chiefly due to the demand of English bankers residing in England that this new feature was introduced. The method of application was simple. That part of the road already finished was mortgaged in order to secure additional funds to complete the line, build terminals, and provide working capital. In the beginning, only short-term bonds were issued, seldom or never exceeding 20 years in duration. Permanent borrowing by corporations was not yet fashionable and these first loans were regarded as temporary, the company in due time intending to extinguish the debt the same as it would a bank loan. The mortgage, however, jeopardized the interests of the stockholders in that it was granted a prior claim upon the earnings and assets of the

corporation. The mortgage has steadily grown in importance, until today it is the chief instrument in railroad finance. The practice of issuing mortgage bonds, however, did not become universal. The railroads of New England, and to a large extent those of the entire Atlantic seaboard, were built chiefly by the simple method of issuing stock. West of the Alleghamies, however, away from the source of investment funds, the practice of mortgaging completed stretches of road went on at an increasing pace.

Mortgage bonds had become so general that already in 1855 over 41 per cent of the capitalization of all the railroads in the United States was represented by mortgage bonds. The proportion for the western and southern roads was much higher than this, since eastern roads quite generally were more conservative in their financing. Some instances are found where the mortgage indebtedness went as high as 60 per cent or more of the capitalization. The financial structure of the different roads was not homogeneous even in any section of the country, except, perhaps, New England, which was traditionally adverse to issuing bonds. The Chicago and Northwestern was built largely out of stock subscriptions, while the Erie already in 1851 showed \$14,000,000 of bonds and only \$6,000,000 of stock, both exceptions to the usual expectation in their respective territories.

The Construction Company—With the close of the Civil War came new fashions in railroad finance which were not always creditable to their sponsors. Here enters the familiar construction company. A hypothetical construction company of this time is described by Prof. William Z. Ripley in his *Railroads Finance and Organization* as follows:

A knot of promoters, planning an enterprise, first formed a railroad corporation and authorized, let us say, capital stock to the amount of \$1,000,000. This consisted of 10,000 shares, par value \$100. The stock was issued to themselves part paid (\$10 per share)—\$100,000 in all being temporarily borrowed by them individually for the purpose. A glowing prospectus then offered for sale two million of bonds with the proceeds of which the road was to be built. These bonds were sold at 80, with perhaps a bonus of stock thrown in, thus realizing \$1,600,000 in cash. From this the promoters reimbursed themselves for the \$100,000 already advanced, by charging a 5 per cent commission for marketing the bonds. This enabled them to pay off their personal loans. It left \$1,500,000 cash in the treasury of the railway corporation as well as a controlling portion of its own capital stock. The next step was the organization by these same directors of a construction company, which built the road for an actual outlay of \$1,200,000. The railway directors now voted to pay their construction company \$1,500,000 in cash for this work and in addition the remainder of the share capital of the road. A profit to themselves of \$300,000 plus the prospective value of the capital stock, which had cost them nothing, obviously resulted. The promoters had realized 300 per cent on their first investment, itself borrowed, from the profits of the construction company. Moreover, they controlled the railroad

through its capital stock. Thus were the foundations of a number of large fortunes laid.¹

The main interest here is the position in which the new method of finance placed the securities. Observe first the bonds. The corporation agreed to pay \$2,000,000 to bondholders at the end of, say, 20 years in return for only \$1,600,000, and they were given a lien on property valued at only \$1,200,000. Obviously, the standard used in real-estate mortgages which required a margin of 40 or 50 per cent of property value in excess of the amount loaned, a standard not exceeded in early railroad finance, was relegated to oblivion. "The construction company almost inevitably invited overcapitalization," says Professor Ripley.

Effects of Overcapitalization.—Financial affairs were mostly conducted in secret, construction accounts were padded with operating expenses, and the bondholders seldom knew the actual state of affairs. If the railroad mortgage bond was to regain its high standing as an investment issue, it became necessary to put back into the property out of the earnings of the road sufficient funds to make good the margin of safety formerly maintained. It was doubtless figured also that valuable land acquired along the right-of-way would speedily increase in value and create a large equity back of the bonds. But this was all in prospect and could not be recognized as a proper basis for mortgage security. The fruits of deteriorated mortgage bonds were reaped following the panic of 1873 when altogether \$500,000,000 of bonds in the United States were in default, the bulk of which was railroad bonds. Thus for the first time in history, railroad mortgage bondholders received a sudden and severe shock, as the unsound methods of railroad finance were revealed.

However unsavory to bondholders were the changes engendered by the new financial chicanery, yet sadder was the plight of stockholders. While the promoting stockholders had nothing to lose, and everything to gain, the investing public had not only bought securities which were all water, but it had also become interested in railroads which had watered their bonds to the extent of 25 per cent through the fraudulent filching from bondholders of this portion of their investment. Stock thus came to represent only intangible possibilities of the future, and many bonds, in effect, were only stocks. Railroad stocks and in fact many bonds lost their position as investment securities and became the football of gamblers on the New York Stock Exchange, bringing ill repute not only to railroads but also to the exchange.

The earliest legal theory of corporation financing regarded the stockholder as the successor of the partner in business, and as such he was liable for the debts of the corporation. It accordingly became a matter of law in many of the states, including Massachusetts, that corporations were forbidden to issue bonds in excess of their capital stock, resting the

¹ P 18

case upon the supposed genuineness of the capitalization represented by stock. Under this theory it was impossible to create mortgages in excess of the property represented by stock. If the stock was not fully paid, the subscribers could be held for the unpaid balance. The law, however, did not extend this theory in case of third parties. The construction company was the device for circumventing the law, for it became the original owner of railroad stock which passed through its hand to third parties who were then beyond the pale of the law. The finishing touches to the older theory that stock represented *bona fide* investment were administered when the courts allowed the promoting officers of the corporation to set a value upon the property of the corporation. Any value whatever could then be placed upon the services of the promoter and construction company, and the door was wide open for the unconscionable watering of stock which characterized the succeeding quarter of a century, not only in railroad but also in industrial and public-utility finance.

Overissue of Bonds.—The excessive emission of bonds continued with increased momentum until, for the country as a whole, in 1889, bonds and stocks were about equal in amount. Many states forbade issues in excess of the capital stock. The Middle West, however, was the chief seat of excessive issues. The degraded status of railroad stocks—they seldom sold at a price approaching par—together with the legal prohibition in most states against the issue of stock except at par, forced the railroads to issue still greater amounts of bonds in order to secure necessary funds for new construction, improvements, or working capital. Stock was commonly given to bond purchasers as a bonus in order to stimulate the sale, this could be done on the theory that the discount was on the bonds, the stock being fully paid, thus complying with the letter of the law.

Several new types of railroad bonds had their origin in the period from 1873 to 1893. So great was the amount of mortgage bonds being issued that Congress forbade the Union Pacific, in which the government was financially interested, to issue more bonds which would jeopardize the government's security. The law was circumvented, however, by the invention of the collateral trust bond. Subsidiary corporations of the Union Pacific were created for the purpose of constructing branch lines or new divisions of the road. The securities of the subsidiary corporations were then pledged by the Union Pacific corporation as security for further bond issues upon its own general credit. This practice afterwards became widespread.

Convertible bonds had their origin in this period also. They were issued mostly without lien security and carried the privilege of conversion into stock at the pleasure of the holder. This seemed attractive to the investor for the reason that he was guaranteed a comparatively high rate

of interest as long as he held the bond and, should the railroad be successful, he had all of the advantages of the stockholder in the rise in price of his security and in any extra dividends that might be declared. Although this kind of bond was employed chiefly by Daniel Drew and Jim Fisk in connection with the Erie Railroad for manipulating the market in its securities, it nevertheless appealed to a class of investors midway between the mortgage bondholder and the stockholder and at the same time tended to preserve the soundness of mortgage bonds.

Yet other avenues of escape were open to railways hard pressed for capital, especially during years of financial stress. This was the issue of debenture bonds and short-term notes. They were first issued when it was impossible to raise money in any other way; in some cases they only postponed the day of reckoning for the companies which had flagrantly disregarded older and better methods of finance. The Atchison issued one of the first debentures in the United States in 1884. The banker, Jay Cooke, was responsible for some of the first notes when money could not be obtained in any other way. This was in connection with the Northern Pacific in 1872 and again in 1892. In the cases mentioned they led to failure and reorganization with the usual sacrifice entailed upon junior bondholders and noteholders. The note issues of the more important railroads in 1893 amounted to over \$124,000,000.

Railroad car trust certificates, too, had their beginning during these years. These certificates were issued by a car trust association to finance the rolling stock of railroads. The title to the rolling stock under the Philadelphia plan, where they originated, remained in the association while the railroad paid for the equipment on the instalment plan, assuming title when the payments were completed. The association then sold the certificates to the public, and the funds were used to purchase the equipment from the manufacturing companies. New and impoverished roads made use of this form of borrowing. Again the mortgage bond was protected, but the obligations of the road were increased and brought bankruptcy one step nearer. In 1890 there were almost \$50,000,000 equipment obligations outstanding.

Although checked by the panic of 1873, foreign investments in American railroads revived after a few years. The majority of the stock of five large American railroads, the Illinois Central, the Pennsylvania, the Louisville and Nashville, the New York, Ontario, and Western, and the Reading was held abroad in the early nineties. The panic of 1893 saw foreign liquidation of American holdings on a large scale, but this lasted only a few years, when there was a revival of interest in American investments. In 1899 American securities held abroad, most of which were railroad stocks and bonds, amounted to over \$3,000,000,000, estimates in 1876 place railroad securities held abroad at \$375,000,000. England was the main source of capital, investors in that country holding

in 1899 approximately \$2,500,000,000 Holland and Germany were the other main sources

Stock Dividends.—Capitalization of railroads was increased during these years by means of stock dividends The practice was looked upon as favorable treatment of stockholders when a lean treasury made the payment of dividends impossible, stockholders being placated in this way In view of the laws of some states which required stock equal to that of bonds, stock dividends became necessary in order to open the way for further issues of bonds, it was practically impossible to sell stock at par and it was illegal to sell it at less than par In 1868 the New York Central issued an 80 per cent stock dividend, the Louisville issued a 100 per cent dividend in 1880, and the Boston and Albany, a 100 per cent dividend in 1882 Many other examples could be cited In short, the seventies and eighties are replete with examples of stock dividends

The Panic of 1893.—The panic of 1893 was the most disastrous in our history for railroads and their security holders Both alike reaped the fruits of excessive bond and note issues, the interest charges could no longer be met out of current earnings Fifty-seven companies, involving one-fourth of the total capitalization of all the railroads in the United States and one-sixth of the mileage, had to undergo the pains of financial reorganization during the years following 1893 Among them were some of the leading systems, including the Reading, Baltimore and Ohio, Erie, Southern, Wabash, Union Pacific, Northern Pacific, Atchison, and so forth Carl Snyder says that, "Practically without exception these failures represented a great scandal, a history of disgraceful stock-watering or stock-jobbing, and a shame to American railroading"¹ The security holders, both bondholders and stockholders, were called upon to suffer for the sins of financial mismanagement As a rule the first-mortgage bondholders came through unscathed, but there were some notable exceptions to this The junior bondholders and noteholders, however, together with the stockholders, bore the brunt of the disasters The junior bondholders were compelled to accept in reorganization a reduction in their principal and to exchange many of their holdings for preferred stock of low dividend rate, while the stockholders were often obliterated entirely or were assessed upon their holdings in order to secure funds for the continued operation of their property Annual fixed charges, affecting chiefly junior bondholders, were reduced during a period of 4 years by almost \$20,000,000

Consolidations.—Beginning with 1898, the United States entered upon a period of prosperity unapproached by any other country in the history of the world It brought great transformation in the financial structure of railways It was the era of mergers and consolidations, the time of welding railroads together into systems of systems. The era of

¹ See article, *Annals*, Vol XXXV, pp 164-175

prosperity produced an enormous supply of capital funds in the United States. The discovery of gold in Alaska and the western states stimulated men to larger things. Securities were repurchased from Europe in large quantities and American investors at last were coming into their birthright. Within the course of a few years the control of practically all American railroads was safely lodged at home. Many bonds, however, were still held abroad, estimated in 1914 at \$3,400,000,000, or about one-third of the mortgage indebtedness of the railroads of the United States.

The method of financing from within, employed in the preceding period by the Chicago and Northwestern and the Great Northern, was now extensively employed by the strongest roads. The creation of huge corporations made it possible also to borrow money on the credit of the parent company, which without the intervening construction company employed its own force in supervising new construction. This method rendered obsolete the wasteful practices of the old construction company and was the beginning of the end of overcapitalization. But even here there are outstanding examples of abuses, as in the case of the Puget Sound extension of the St. Paul Railroad, the St. Louis and San Francisco, the Rock Island, the New Haven, and others. In the case of the St. Paul, issues of stock were made to comply with the laws of Washington, where the Puget Sound was incorporated, requiring stock equal to the amount of bonds. The parent company sold its own stock to the public in order to raise the funds for this extension and accepted bonds of the new company in exchange for the cash realized from the sale of its stock, it also received an equal amount of stock which was all water. Although the construction company with all of its unsavory reputation in the era of great railroad building is now obsolete with responsible corporations, it has projected itself through the intervening years almost down to the present time and the long trail of failures and receiverships has always been close upon its heels. Such was the recent experience of the St. Louis and San Francisco, which was milked of its substance through the inordinate profits accruing to the owners of the construction companies employed in the extensions.

Since 1900, railway capitalization has almost doubled in amount, while mileage has increased only about 35 per cent. Railroad investment has taken the form of improvements, such as extra trackage, reduction of grades, safety devices, increased terminal facilities, all occasioned by a rapidly increasing density of traffic. Bonds have increased more rapidly than stocks, they have more than doubled in amount. This is accounted for by the low rate of interest on new capital funds during the prosperous period beginning with 1898. In the consolidation of railroads in this period, the collateral trust bond made it easy to combine and retain control by the parent corporation. Capital stock has been increased largely

in connection with consolidation and subscription rights. Examples are the financial operations of the Rock Island and the New Haven. Preceding 1912, the latter increased its capitalization from \$93,000,000 to \$417,000,000, most of which was used for the attempted railway monopoly in New England. Professor Ripley says of this instance, "A tale of more reckless disregard of the interests of the public and of investors alike—a more complete breakdown of service in the form of intolerable losses and delays and appalling accidents—has never been spread upon the records."¹

Recent Financing.—Prior to the adoption of the uniform accounting system in 1907, many prosperous roads charged to operating expenses large amounts of expenditures for improvement, while the weaker roads pursued the opposite policy of charging what properly belonged to operating expenses to capital account. The former roads today show a condition of undercapitalization and the latter of overcapitalization. The net result was probably too heavy charges to operating expenses.² At that time the book value of road and equipment was approximately one-half of what it is now, thus making the uncertain portion of the investment account approximately one-half of present investment.

According to the property investment account of the Interstate Commerce Commission new investments in railroads during the decade 1920 to 1929, inclusive, amounted to \$6,200,000,000. Only \$2,507,000,000, or 40 per cent, of this was raised through the issue of new securities, leaving \$3,693,000,000, or 60 per cent, supplied by the roads themselves out of surplus earnings. In contrast to the general result, the Baltimore and Ohio in the period 1910–1928 spent \$400,000,000, of which only \$80,000,000 came from earnings, while the balance was raised chiefly through mortgage bonds. This is a reflection of the low credit of railroads since 1910.³

Bonds versus Stocks.—During the same 10-year period bonds accounted for \$2,450,000,000 and stocks for only \$440,000,000, or 82 and 18 per cent, respectively. This tendency to raise new money through bond issues is partly a reflection of the poor credit position of railroads, low stock prices (for most of the period most railroad stocks sold below par), and a desire for railroads to raise new funds as cheaply as possible, leaving larger equities in earnings for the stock. This latter consideration doubtless panned out as expected, since new improvements have saved in operating expenses their interest several times over. Nevertheless, it has gradually increased the ratio of bonds to stock.

Present Capitalization.—After deduction of intercorporate holdings among the railroads themselves, the net capitalization of all railroads at the end of 1930 was \$17,007,000,000. Of this amount, funded debt

¹ *Railroads Finance and Organization*, p. 252

² *Recent Economic Changes*, Vol. I, p. 265

³ *Ibid.*, p. 266

accounted for \$11,359,700,000 and stocks \$5,648,200,000 ¹ The funded debts of railroads thus amounted to approximately two-thirds of the total capitalization, although they amounted to less than 50 per cent of their property investment

Railroads taken together have ploughed back into the properties over many decades of history sufficient capital out of earnings to eliminate all water and leave a good margin of property values for surplus account Yet the capitalization is not well proportioned between bonds and stocks Second-rate railroad bonds in particular, and in many cases first-rate bonds which had formerly been eligible to savings banks, trust funds, and insurance investments, have suffered materially in standing through the depression of 1930-1932 It was claimed at the hearings in the Fifteen Per Cent Rate case that whereas three-fourths of all rail bonds were eligible for investments in 1930 under the savings bank laws of New York, only one-fourth was eligible at the beginning of 1932 This resulted from the provision that interest must be earned one and one-half times over In fact, only the strongest systems were able to cover interest charges in 1931, the smaller roads and a number of the larger ones showed deficits after charges The New York Central, the Baltimore and Ohio, and the Delaware and Hudson showed only a small margin over fixed charges, while the Illinois Central, the St. Paul, the Rock Island, the Lehigh Valley, the Southern, and so forth, reported sizable deficits

The fluctuating character of railroad revenues suggests fewer bonds and more stocks in future financing. The amount of bonds a railroad can safely issue must bear a definite relation to the amount and stability of earnings Further than this, little of a general nature can be said The usual comparison of bonds with stocks is of little help, since this ratio has no relation to earnings Nevertheless something can be learned concerning proper capitalization by comparison of selected roads

TABLE 36—PERCENTAGE OF BONDS TO STOCKS IN SELECTED RAILROADS IN 1929

Railroad	Bonds, Per Cent	Railroad	Bonds, Per Cent
Illinois Central	70	Southern	60
New Haven	57	Atchison	46
Baltimore & Ohio	64	Missouri Pacific	70
Erie	53	St. Louis & San Francisco	71
New York Central	60	Union Pacific	53
Pennsylvania	49	Canadian Pacific	43
Northwestern	66		

The low percentage of bonds to stocks in some cases, notably the Erie, is merely a reflection of watered stock. In general, however, the statistics as given have a lesson to teach Comparisons may be fairly made between conservatively financed roads Of all American railroads the Atchison and the Pennsylvania with 46 and 49 per cent bonds, respectively,

¹ *Railway Statistics of the United States*, 1930, p. 69

make the best showing, while the Canadian Pacific shows only 43 per cent bonds. Official records show that receiverships among railroads are of annual occurrence but that periodical epidemics occur in the wake of business depressions. At the end of 1894 there were 40,819 miles, or almost one-fourth of the total mileage of the country, in receivership. In the period just prior to the war, every year shows large mileage placed in receivership, even in the prosperous year 1916 there were 34,804 miles of road operated by receivers. This period included such roads as the Missouri Pacific, the Saint Louis and San Francisco, the Boston and Maine, the Pere Marquette, the Wabash, and the Rock Island. For the past 15 years insolvencies have been less numerous but the record is marred by the failure of the Milwaukee in 1925 with its 10,238 miles of line. In the entire period from 1881 to 1929, inclusive, 178,409 miles of railroad involving over \$10,200,000,000 of stocks and bonds went through the pains of receivership and reorganization. This was over 70 per cent of the total mileage in 1929 and exceeds the average mileage for the period. Several large systems such as the Erie, the Atchison, the Union Pacific, and the Wabash, were in receivership two or more times during the period.

Causes of Failure.—In the very earliest days of railroad construction, railroads failed because of the lack of capital necessary to complete construction or acquire equipment, because of lack of engineering talent, and on account of downright fraud in construction and financing. The receiverships of the eighteen seventies were due to the post-war boom, deflation of the currency, and the agricultural breakdown. The receiverships of the eighteen nineties were caused by the severe business depression and the overextension of branch lines. In the following period the effects of these difficulties continued and to them were added the evils of the consolidation period in the era of trust building. More and more intensive investment of capital was in progress, while the earnings increased at a less rapid rate. By and large it seems to have been an example on a grand scale of the operation of the law of diminishing returns. Overexpansion and consolidation were largely financed through the issue of bonds. The increase in interest charges incident to large amounts of bonds, accompanied by lagging earnings, often reached the breaking point. The failures just prior to the war were of this character but they were occasioned also by heavy short-time borrowings for long-time investment, and inability to liquidate these in the face of inadequate earnings was common. The failure of the Milwaukee was due primarily to the Puget Sound extension, involving large outlays of capital in a thinly populated territory, competition of the northwestern transcontinental roads, and the Panama Canal. It is a clear case of greatly overexpanded facilities to the Northwest which still are millstones about the necks of all the roads serving that territory.

Margin of Safety.—The best measure of financial solvency is found in the excess of income over fixed charges. Income applicable for fixed charges is made up of net railway operating income and all other income, while fixed charges include interest, rents, taxes, and so forth. The following table shows essential data bearing on the question of solvency.

TABLE 37—OPERATING RESULTS OF RAILROADS
(000,000 omitted)

Average	Net railway operating income	Other income	Total income	Fixed charges	Margin of safety, per cent	Net income for stock	Percentage net income to stock
1911-1915	729	235	964	558	43	458	5 57
1926	1,229	297 ¹	1,526	701	54	883	9 43
1927	1,077	311 ¹	1,388	706	50	741	7 78
1928	1,182	320 ¹	1,502	706	53	855	8 79
1929	1,262	359 ¹	1,621	714	56	977	9 92

¹ For Class I railroads only

Mortgage Bonds—First-mortgage bonds are the safest of all railroad securities from the contractual point of view, save only receivers' certificates issued to save the road from complete ruin and equipment obligations. They confer prior lien upon the assets and earnings of the property covered by them. Their claims in receivership are recognized as prior to all others except equipment obligations. If they are old main-line bonds, and if, in addition, the property covered by them is in a paying position, no sacrifice is demanded of their holders. More recent first-mortgage bonds on the main line and those on branch lines whose security rests upon the earning capacity of property more or less independent of the main line may indeed be called upon to make some little sacrifice in reorganization, but it is always less than that required of junior bondholders. First-mortgage bonds whose security rests upon branch lines of little independent earning capacity or importance to the main road are treated in reorganization according to their contribution to the traffic of the system. If this is small, the bondholders will be called upon to undergo great sacrifices, but in every case their claims will be superior to junior bonds upon the same property. It has now become an established practice to refund all underlying bonds, except in case of early maturity or low interest rates, into a large single, long-time, low interest-bearing, first general-mortgage issue, making the exchange on the basis of the relative merits in each case. But in every case there is no claim superior to first-mortgage claims upon a given piece of property. Second-, third-, and subsequent mortgage bondholders will be treated in accordance with their claims.

Blanket-mortgage Bonds.—Another type of bond frequently encountered in railroad finance is the general- or consolidated-mortgage bond. Its security rests upon a blanket mortgage on the entire system itself. Where there are first, second, or other mortgages existing at the time of executing the general mortgage, they constitute a lien prior to the latter, but if none such exists on specific parts of the system, general mortgages become a first lien upon this property. The security of each mortgage must, therefore, be carefully examined to ascertain its value. In the event of receivership, the claim of general-mortgage bondholders is immediately junior to all other mortgage bonds existing when the general mortgage was executed. General-mortgage claims may, therefore, be superior to first-mortgage claims, if their main security rests upon different properties. But with reference to specific property they can never precede the claims of pre-existing mortgages. In reorganization they are sometimes refunded into fixed and contingent charge securities in direct proportion to their economic strength. Generally, but not always, this type of bond contains an after-acquired property clause which establishes its seniority of lien with reference to future mortgage issues. Subsequent issues of general-mortgage bonds assume a position junior to all liens existing at the time of their issue.

Within the past 30 years, railroads have issued bonds similar to the general- or consolidated-mortgage bonds with the exception that they are open-end, that is, the amount which may possibly be issued in the future is not absolutely limited as in the case of the closed mortgages. Such issues are generally called "refunding," "refunding and extension," or "refunding and improvement" bonds. They found wide use in the reorganizations of the nineties and were given a maturity of 100 years as a usual thing. More recently, railroads have employed refunding-mortgage bonds to refund small obligations of long standing as they successively mature. This makes the old hand-to-mouth method of financing unnecessary and recognizes through the long maturity of the issues that, after all, railroad debts are permanent in their nature. Bondholders are in an economic, if not legal, sense the owners of the property the same as stockholders but without a voice in the management. When first issued, general- or consolidated-mortgage bonds may be only a weak lien, as time passes and the older first mortgages mature and are paid off, the refunding mortgage becomes a senior lien upon the property thus released from encumbrance. Sometimes the amount authorized in the future is conditioned upon the amount of the capital stock outstanding. Other details relating to the purposes for which additional authorized amounts may be issued are stated in the deed of trust. The provisions relating to future issues are important for the bondholder. His interests are best protected when there are protective features attached which prevent overissues in the future. In case of reorganization, refunding bonds hold a position

immediately after all previously issued mortgage bonds upon the property which is pledged for their security. They often suffer severely, being exchanged for income bonds or preferred stock.

Debenture Bonds.—Debentures originated and are still functioning as makeshifts in finance. They are looked upon as temporary issues, running from 10 to 20 years as a rule, at the end of which time the company looks forward to some permanent financing to refund them. They are utilized by strong and weak roads alike, the interest rate is low in the former case, and high in the latter. In case of receivership, debenture bonds are immediately junior to mortgage liens. Like the preceding class of bonds they are refunded into income bonds or preferred and common stocks, generally suffering more than the issues previously discussed.

Notes.—During the past in periods of financial stringency, when it was impossible for some reason or other to issue bonds of any description, railroads resorted to short-term notes of 1, 3, or 5 years' duration in order to raise funds. These were generally of high interest charge and paid off at maturity out of earnings if the issue was not too large, sometimes they were funded by issuing bonds. Notes have no direct lien on any property and are treated much like debenture bonds in reorganization. The exact result depends quite largely on the ability of the representative committee in reorganization to secure whatever protection is possible for the noteholders. They are often funded into income bonds and preferred and common stocks at par.

Assumed Bonds.—At the time of reorganization or consolidation of railroads, small corporations frequently pass out of existence through merging their assets with the larger parent company. In such cases the mortgage bonds of the small companies are left undisturbed but are assumed by the large organization. When assumed by a strong corporation, these bonds are much strengthened. Their ultimate security, however, is found in the nature of their lien at the time of assumption which in turn depends upon the economic value of the property pledged as security. This is the principle which governs in receivership.

Guaranteed Bonds.—Frequently, when a large railroad leases a smaller and connecting line, it guarantees both interest and principal of the bonds. This is the common origin of guaranteed bonds. Like assumed bonds, the measure of their priority is found in the terms of the contract at the time of the guarantee. Their value will depend upon the economic value of the property upon which the security rests. Like all obligations previously mentioned, they may precipitate receivership, but upon this event they may straightway be disowned by the receiver.

The remarks in the preceding paragraph apply also to joint bonds issued upon property used in common by several railroads, such as terminal facilities, wharves, and bridges. Usually a separate corporation

is the legal owner of the property and has given perhaps a first mortgage or some other type of lien to the bondholders. If guaranteed by strong railroads which own the stock of the subsidiary company, these bonds possess great merit, for it is unlikely that all of the guaranteeing corporations will default on the interest or principal. They are in fact among the strongest of bonds from the contractual point of view. In case one of the guaranteeing corporations fails, however, the receiver has the power to repudiate the guarantee.

Income Bonds.—There is yet another class of bonds which lies halfway between debentures and preferred stock. The most usual name for these is income bonds, but they sometimes assume the title of adjustment or preference bonds. They are specific promises to pay the par value upon a given date, but the interest is contingent upon the earnings of the corporation. Sometimes the interest is made cumulative from year to year in case of insufficient earnings in any specific year. Although a considerable number of issues of this type existed before the nineties, they owe their existence chiefly to the reorganizations in the middle nineties and have been continued in recent reorganizations. They are given in exchange for fixed-charge bonds, thereby reducing the fixed charges of railroads, previously too heavily burdened with interest. As a rule, they are the weakest of all bonds issued by railroads. Sometimes they are a source of trouble between bondholders and the railroads, arising from disputes over such accounts as depreciation, betterments, and maintenance.

Convertible Bonds.—Convertible bonds are common in railway finance. They are merely debentures issued with the privilege of converting them into common or preferred stock under certain conditions. These issues are floated when it is impossible to float stock on a creditable basis to the corporation, but it is expected that they will sooner or later be converted into stock. They are thus at bottom a method of selling stock at a time when it would be impossible to market issues other than direct obligation.

Convertible issues are usually exchangeable at par, but it sometimes happens that more par value of stock is offered in return for the surrender of the bonds. If the issues are large and the corporation subsequently shows improved earning power, or if there is a more favorable market for securities in general, conversion weakens the position of the old stockholders. The conversion privilege usually begins several years after issue and extends for a considerable period but terminates before maturity of the bonds.

Collateral Trust Bonds.—Collateral trust bonds are also frequently encountered in railroad finance. In the beginning, they were issued by large corporations pledging securities, usually mortgage bonds, on some unencumbered portions of their property, thus avoiding several small

issues difficult to market at an advantage, yet of great strength in themselves. They were also utilized in financing extensions of large companies, but their most characteristic use came in the period of consolidations starting with the revival of prosperity in 1898. More recently, investment holdings of certain railroads have been pledged as security for collateral trust bonds. While the collateral in railroad finance has usually been bonds of substantial security, occasionally there have been issues of collateral trust bonds based upon the stock of the operating or subsidiary company. This, of course, is only one more instance of financial chicanery and deceit. Such was the Rock Island issue. The strength of collateral trust bonds from the contractual point of view is little better than that of the underlying securities, which in turn are as strong as their lien affords upon the property back of the collateral. While they are in addition direct obligations of the issuing corporation, they are from this angle only debentures and, therefore, not the strongest type of bond. Their strength in receivership is presumed to be that of the collateral. Caution should be inserted here against misnaming these bonds, mortgage, or first-lien bonds, since then lien is ultimately that of the collateral which may be anything or nothing at all.

Equipment Obligations—The main contractual features of equipment obligations in general have already been treated. Some points with reference to railroad equipment obligations, however, may be emphasized here. In the first place, there is probably little to choose between the car trust certificate and the direct railroad obligation represented by the equipment bonds or notes. In one case of receivership, preference was shown the car trust certificate over the equipment bonds. But the record of equipments in general is so good that only in exceptional cases need the investor discriminate between the different classes. The essential fact in all such issues is that the investor has a lien on the property covered, and the courts respect this in receivership even above first-mortgage bonds. Equipment obligations of all kinds have been pronounced the strongest of corporate obligations. Their record is even better than that of state and municipal bonds in the United States. Never, except in one case some 50 years ago, has the holder of a railroad equipment security of which record is obtainable lost on his investment.

The contract is perhaps more nearly standardized in these issues than for any other type of corporation security. It is drawn so that all of the obligations which are issued in serial form mature before the equipment is scrapped. Standard railroad cars, on the average, when properly kept in repair, last from 12 to 15 years or more. Locomotives last much longer. Obsolescence figures prominently, also, in railroad equipment, especially in the case of wooden cars. The best railroad equipment obligations cover a diversified list of equipment, including about one-third of the value in locomotives. Their maturity should fall well within the

useful life of the equipment. When so written, as they invariably are, the serial numbers mature more rapidly than the equipment depreciates in value, and the equity back of the remaining outstanding obligations constantly increases. Equipment obligations, covering as they do only movable railroad property, are easily thought of as being in a class different from other railroad issues. Their final security, for the most part, is independent of the railroad itself. Equipment obligations of the future may possibly be issued by a national association specially organized for the purpose. This would emphasize the individuality of the obligations and relieve the railroad of the necessity of financing its own equipment.

Preferred Stock.—There are some very early issues of preferred stock dating back as far as 1877, in connection with bankrupt roads. They were issued but sparingly, however, until the middle nineties, when through more extensive reorganizations they replaced securities of fixed charge. As a rule, these issues carried preference as to dividends, but not as to assets in the event of liquidation. Most issues were protected, also, by a clause prohibiting the creation of prior preference securities without the consent of the preferred shareholders. These issues are mostly still outstanding and bear a low rate of dividend. Railroad preferred stocks are rarely made cumulative, owing largely to the circumstances of their origin. They are, in addition, seldom redeemable, but when they contain this provision the terms are practically always at par. A participating feature is often attached to railroad preferred issues, which entitles them to share equally with the common stock after the latter has received dividends equal to the rate stipulated for the preferred. When it comes to receivership and reorganization, the advantages of preferred over common are not great, both alike have to bear the brunt of the loss.

Common Stock.—Prior to 1930 railroads paid out on the whole approximately 60 per cent of the net income over annual surplus in dividends. Railroad stocks are treated as investments rather than speculations and the policy has been to maintain dividends through the current depression if covered by earnings. Academic discussions concerning maintenance of dividends out of past earnings in depression years have found no counterpart in practice. During 1931 and 1932, based upon vanishing earnings, some of the outstanding systems of the country reduced or dropped their dividends to bring them into line with earnings. Such action was taken by the New York Central, the Pennsylvania, the Northwestern, the Baltimore and Ohio, the Illinois Central, the Northern Pacific, and the Atchison.

The investment record of some of the individual systems of the country is of importance here. The Pennsylvania Railroad from its incorporation in 1846 down to 1930 paid on the average over 6 per cent on its stock each year and never missed a year without some cash distribution. Down to 1868, it paid also 40 per cent in stock. Sub-

sequently and down to 1893 it paid 22 per cent in scrip redeemable in stock, or cash. Altogether from its organization down to 1930, stock distributions amounted to almost 78 per cent of the original par value per share. Since 1893 only cash dividends and rights have been distributed. Dividends have gradually increased from \$2.25 per share in 1921 (reduced from \$3 annually in 1908 to 1920) to \$4 in 1929. In 1932 the road ceased payment entirely. Dividend payment on the common stock of the Union Pacific since reorganization has been gratifying. Three dollars and fifty cents was paid in 1900 but this was increased to \$4 in the following year, to \$8 in 1906, to \$10 in 1907, reduced to \$9 in 1914, to \$8 in 1915, increased to \$11.50 in 1927, and reduced to \$10 in 1928 and to \$6 in 1932. Valuable stock distributions were made in 1914.

From 1905 to 1927 dividends on the New York Central varied between \$5 and \$7 annually, but in 1927 the rate was raised to \$8, which was maintained till 1931 when it was dropped to \$6 per share being omitted entirely in 1932. During the past 30 years, at intervals, the company has offered stock to old stockholders at \$100 per share (except in 1902 when the price was \$125). The Southern Pacific paid \$6 annually from 1907 to 1932 and at times also distributed valuable rights. The Northwestern for many years prior to the war paid \$7 per share annually but since then disbursements have been below that amount. The roads of the northwest in general have found it necessary to reduce their dividends from the pre-war rates.

Under the Act of 1920 provision was made for the accumulation out of excess earnings of a reserve equal to 5 per cent of the property valuation.

TABLE 38—DIVIDENDS ON RAILROAD STOCK

Year	Amount of dividends, in million dollars	Factor of safety, per cent	Average rate on all stock, per cent
1911-1915 (average)	402	12	4.64
1926	473	46	5.06
1927	491	34	5.95
1928	510	40	5.25
1929	560	43	5.70
1930	603	Deficit	6.02

for the payment exclusively of fixed charges and dividends. This may be drawn on whenever the actual return falls short of the standard return allowed. Following the reorganizations of the eighteen hundred nineties, railroads found it necessary to build up their property largely out of earnings. This resulted in a conservative dividend policy which was wise in the long run. The Act of 1920 changed the fundamental outlook on dividends. It made obligatory rates high enough to maintain property values and doubtless looked to the future support of railroad

credit so that new improvements could be made out of new capital issues. Although more than one-half of the improvements have been made from earnings since then, the dividend policy has been more liberal than it was prior to 1920. This is justified on account of the accumulated surpluses of the stronger systems as also from the fact that regulation does not contemplate the building up of surplus accounts out of earnings. The table on page 342 shows the dividend policy of railroads as a whole. The recent depression proved disastrous to dividends on railroad stocks. During 1931 at least 35 roads reduced or omitted their dividends entirely, 13 abandoned dividends on both preferred and common stocks.

Market for Railroad Securities.—From the beginning railroad stocks and bonds have enjoyed a public market. They have been listed on the New York Stock Exchange throughout the history of railroads. They held the center of interest down till 1914 and were considered the most important class of American investments. The term "investments" itself was almost synonymous with railroad stocks and bonds, industrial securities were referred to as "speculative."

Railroad bonds have long held an important position in the portfolios of insurance companies, savings and commercial banks, trust funds, endowments, and the like. It has been estimated that in 1915 approximately \$2,500,000,000, or about one-fourth of all outstanding railroad bonds, were thus held. At the present time it is estimated that about \$6,600,000,000, or 60 per cent of outstanding bonds, are held in this way. Life insurance companies, mutual savings banks, and commercial banks account for about \$5,400,000,000. The advance in ownership of railroad bonds by these institutions has been accomplished by purchase from individuals, in part at least, who have sought to escape the high federal, state, and local taxes following the war.

The railroads have enjoyed a broad distribution of stock for many years. In 1904, 20 leading systems reported altogether 154,610 stockholders. The increase since then has been rapid. These same roads had 718,142 stockholders in 1920. In 1931 the Committee on Interstate and Foreign Commerce of the House of Representatives made a thorough canvas of ownership of railroad stocks. It found that 160 Class I roads had 840,000 names on their books December 31, 1929. The number has increased since then. The Pennsylvania Railroad alone had 243,361 stockholders at the end of 1931, an increase over the two preceding years of almost 25 per cent. At the same time the six leading companies, after eliminating the 30 largest holders of each, showed 460,000 holders with average of 60 shares each.

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CHAPTER XIX

PUBLIC-UTILITY REGULATION

Meaning of Term.—Consideration of the legal theory of public-utility regulation usually begins with the *Munn* case, decided in 1876. In the language of Chief Justice Waite, private property is affected with a public interest when it is used

in a manner to make it of public consequence, and affecting the community at large. When, therefore, one devotes his property to a use in which the public has an interest, he, in effect, grants to the public an interest in that use, and must submit to be controlled by the public for the common good, to the extent of the interest he has thus created.¹

In a recent case Chief Justice Taft said, the phrase "clothed with a public interest" means

more than that the public welfare is affected by continuity or by the price at which a commodity is sold or a service rendered. The circumstances which clothe a particular kind of business with a public interest . . . must be such as to create a peculiarly close relation between the public and those engaged in it, and raise implications of an affirmative obligation on their part to be reasonable in dealing with the public. The thing which gave the public interest was the indispensable nature of the service and the exorbitant charges and arbitrary control to which the public might be subjected without regulation.²

Legal Classification.—It has been observed previously that historically the term "public utility" embraced only common carriers and analogous undertakings such as turnpikes, bridges, ferries, canals, and railroads. Telegraphs were also brought into this category as common carriers of messages. But this analogy soon appeared to be forced and, therefore, the category of public utilities had to be broadened so as to cover other transportation industries. From this time onward, certain economic tests were used in classifying an enterprise as a public utility.

The first of these tests was where the source of supply was naturally limited, as in the case of water companies drawing their supply from natural watersheds, irrigation and power companies which utilize exclusive sources of supply, and natural-gas companies. The next test applied related to the conditions under which the supply was furnished, as when manufactured gas and electric companies used the public streets in their distributive systems, making it undesirable or impractical for competing

¹ *Munn v. Illinois*, 94 U. S. 113 (1876).

² *Charles Wolf Packing Company v. Court of Industrial Relations of the State of Kansas*, 262 U. S. 522 (1923).

companies to operate, thus only a single source of supply was available to the customer. Scarcity of advantageous sites, as in the case of elevators, wharves, terminal companies, and the like, and limitations set by the time element as in the cases of telephone and telegraph companies, innkeepers, and cab companies, all of which place the customer in a position of dependence. Courts have even gone so far as to set up tests on the basis of the possibility of effective competition entering the market ¹

Stages in Regulation—The growth of cities already in the early part of the nineteenth century rendered essential the services of public-utility companies. These services were first provided through special grants of legislatures, incorporating public-service companies with franchises to operate in the streets of specified cities. The classic example of this is in the case of Colorado which as late as 1864 (when still a territory) incorporated the Occidental Gas Light Company with the exclusive privilege for 30 years of supplying Denver with gas lights. In 1867 the Denver City Horse Railway Company was chartered for 35 years with the exclusive right to construct and operate in the city of Denver.

But the method of legislatures in imposing public-service companies upon cities without their consent soon met with local opposition on the ground that such action was necessarily short-sighted and conflicted with local grants which themselves were subject to repeal by legislatures. The first stage in regulation was terminated by constitutional enactments in a number of states which prohibited the granting of rights to use city streets without the consent of the local authorities.

The custom of granting special charters soon became burdensome to legislatures on account of the numerous applications. It was objectionable also because it led to restrictions and special privileges through perfunctory actions of legislatures. The practice of granting general charters was abandoned in favor of free incorporation laws with special privileges to none. Although special charters continued to be granted in some states even as late as the seventies, some general incorporation laws appeared as early as the thirties.

But the movement toward general incorporation laws brought a relaxation of legislative control, since only a few persons were required in order to organize a new utility and charters could be obtained merely upon application. Under this system in the latter half of the nineteenth century the free competition of utilities grew up in many localities and numerous abuses crept into utility practice. Among these were fraudulent finance, overcapitalization, excessive and discriminatory rates. The rights of the cities over against those of the companies in granting special franchises to local companies were as yet ill defined. The municipality rather fell back upon the principle of free competition in matters of

¹ See M. G. GLASSER, *Outlines of Public Utility Economics*, pp. 173-174.

control, often granting several franchises to as many companies to perform identical utility service in the same territory. As an example of this, Denver in 1880 provided for a general electric franchise to "all comers" to supply the city with electric lights and erect posts and other appliances required in the business, provided only that "said companies do not obstruct the public thoroughfares."¹

The change from special to general incorporation laws brought a change in conception of the charter from that of a special grant of privileges to that of a free right to all comers. This brought a change in court theory also. In the famous Dartmouth College case, decided in 1819, charters were regarded as contracts between the state and the corporation which cannot be impaired by subsequent legislative acts. Loosely drawn charters and laws thus opened the way for immunity from regulation in the interest of the consumer. If charters were contracts they were brought under the Federal Constitution, which says "no state shall pass any law impairing the obligation of contracts." Under such judicial interpretation many public utilities enjoyed freedom from regulation, competition, and even taxation.

To combat this situation the courts soon found it necessary to develop the doctrine that states surrendered their legislative power over corporations only in cases where it was expressly stated instead of merely being implied.² The doctrine of inviolability of contract has never received full judicial assent on the ground that legislatures may not divest themselves of legislative powers in the future. Courts have generally recognized this contention where public health, public morals, and public safety have been involved.³

The position of the courts as to regulation led to change in the policy of states in granting franchises, and the power of the state to alter, amend, or repeal in the future was reserved. It now became the task of the courts to protect property rights against undue legislative action against the corporations. In this task the courts finally fell back upon the theory that the relation between the utility and the patrons was that of status instead of contract—a conception that had its origin in the feudal system where there was a definite relation between lord and man. This position was well stated in *Smythe v. Ames* as follows:

A corporation maintaining a public highway, although it owns the property it employs for accomplishing public objects, must be held to have accepted its rights, privileges and franchises subject to the condition that the government creating it, or the government within whose limits it conducts its business, may

¹ GLAESER, *op cit*, p. 204.

² *Charles River Bridge v. Warren Bridge*, 11 Peters 420 (1837).

³ *Stone v. Mississippi*, 101 U. S. 814 (1880), *Butchers Union Co. v. Crescent City Co.*, 111 U. S. 746 (1884), *New Orleans Gas Co. v. Louisiana Light Company*, 115 U. S. 650 (1885).

by legislation protect the people against unreasonable charges for the services rendered by it. It cannot be assumed that any railroad corporation, accepting the franchises, rights and privileges at the hands of the public, ever supposed that it acquired or that it was intended to grant it, the power to construct and maintain a public highway simply for its benefit, without regard to the rights of the public.¹

Local Regulation—The attitude of the public toward local utilities was at first, as in the case of railroads, one of great liberality and reliance upon competition through a multiplicity of franchises. Cities were growing rapidly and service at almost any price and on any terms was demanded. This was the pioneer stage of boom and promotion for most of the utilities which carried with it real-estate booms and speculation.

But toward the beginning of the twentieth century, cities began to protect themselves against poor service and excessive charges through ample publicity, limitation of the period of the franchise from 20 to 50 years, and the exercise of the power to regulate rates and service.

While the exclusive franchise was not uncommon, different companies were commonly granted franchises under restrictions to carry on the same kind of business within the same municipality, upon the theory that competition would thus restrain the forces of monopoly, rates would be low, and the service good. But it did not turn out as expected. The naturally monopolistic character of public-utility services asserted itself, competition proved destructive both to the corporations and to the rendering of satisfactory service to the public. Many companies got no further than the franchise which was then used to threaten the success of those already established. The mere possession of a competitive franchise created uncertainty and, in order to dispose of the constant menace, extortionate prices were paid in acquiring franchises from their owners. The competitive franchise thus became a factor in speculation in the securities of public-utility companies. Many large fortunes were built up in the United States upon no better ground than the competitive franchise. Delos F. Wilcox says.

While it is probable that more fortunes have been made out of street-railway franchises than out of any other kind, speculation and profit-taking were by no means confined to this utility. In the early days gas and water franchises and later electric light and telephone grants were involved in the same riot of speculation.

Cases of overcapitalization and large dividends were numerous in all classes of public utilities before the force of public regulation was felt. As early as 1885, Massachusetts created its Gas Commission with power over rates and capitalization. Outside this state, however, little or no regulation was exercised by commissions until 1907. Street railways furnish the best illustration of the overcapitalized condition of

¹ 169 U. S. 545 (1898). See also GLASSER, *op cit*, pp. 205-210.

public utilities in general. Around 1900, the capitalization per mile of American and foreign street railways stood as follows.

Massachusetts	.	\$ 46,600	Philadelphia	\$265,510
New York State	. .	177,000	Boston	100,615
Pennsylvania	.	128,200	St. Louis	306,644
New York City		201,381	London	79,632
Chicago	. .	114,334	Berlin	74,708

John Moody is authority for the statement that, while the capitalization of the Public Service Corporation of New Jersey in 1906 stood at \$210,000,000, its properties, aside from the franchise, could have been replaced for less than \$80,000,000. Much of the overcapitalization resulted from stock dividends, while a large part came through consolidation of properties and obsolescence of equipment.

Out of the flagrant and widespread abuse of the franchise privilege, unrestrained overcapitalization, high dividends, and unbridled speculation grew the demand for closer public regulation. This demand first showed itself in high taxation. If the public furnished the right-of-way for the property of the corporation, it had the right also to a portion of the profits. It was thus by high franchise and other taxes that the public sought to recoup part of its lost privilege.

In this movement a revival of franchise granting was observed largely to induce competitive bidding for privileges and thus increase the city revenues. Franchises were thus bartered to those who paid the highest prices in specified lump or annual sums or a percentage of gross revenues.

Franchises.—By the terms of their charters many of the earlier franchises granted in the eastern states were perpetual or construed to be perpetual by the courts while others were granted for 999 years. Under these grants, especially if the exclusive privilege were added, utilities became very profitable.

The demand for the limitation of profits was met not only through taxation but through limitation of the term of the franchise ranging from 10 to 50 years.¹ Short-term franchises were presumed to protect the patrons against monopoly profits. They were opposed by the utility interests.² But under the system of granting competing franchises the short-term franchise in itself was a flat failure. Consolidation among the companies proceeded and eliminated competition. For instance, the consolidation of 70 gas and electric companies made up the Consolidated Gas Company of New York. Renewal of franchises at expiration under these conditions became imperative in the interest of public service. Property owners' consent laws only increased the uncertainty of the

¹ In Illinois the term was fixed at 20 years, in Ohio at 25 years, and in Michigan at 30 years. H. WILCOX, *op cit*, p. 35.

² National Electric Light Association, *Report of the Committee on Public Safety*, 1907, p. 8.

situation. Failure to provide for disposition of property at the close of the franchise period resulted only in "day-to-day franchises" with the city trumping in at any time with new exactions. These uncertainties restricted new financing of the utilities. Bond issues to be sound could not be extended beyond franchise limits.

For a while a system of franchises terminating at a specified date with regulation of service and rates came into favor and a system of legalized and regulated monopoly was ushered in. It was recognized that public-service corporations render services which best meet the needs of the public under non-competitive conditions. Two or more plants competing for the same service in the same community leads to needless duplication of capital and expenses.

But under the term-franchise the renewal and conditions of renewal were in doubt and the investor contemplated a situation in which his property might have to be disposed of at break-up value. Consequently, further investment of capital in needed improvements was not forthcoming, replacements and repairs were sparingly made, and service went from bad to worse. The examples of the street railways of Detroit and Toronto may be cited in this connection.

The first method of compensation for franchises was a license fee of, say, \$20 or more per car, or on the basis of the number of poles erected, or feet of wire used. Other burdens were paving of streets, installation of gutters, construction of sidewalks, sewers, and so forth. The lump-sum method and compensation based upon gross receipts were also tried. But all of these charges were unwarranted and led only to shifting of the burdens to the consumers. Early in the twentieth century clauses began to appear in charters which provided for the transfer of utilities to the cities at the expiration of the charter. This arrangement served to make the city a potential competitor or to give it some advantage in bargaining power, or provide for exclusive ownership of the utility by the municipality.

Regulation by Franchise.—Maximum rates for local utilities were fixed under franchise grants. In the case of street railways, the 5-cent fare came into almost universal use. But all fixed rates (fixed for the period of the franchise) soon became obsolete with changing conditions. Under the doctrine of the courts, franchise contracts could not be altered. "Only when the franchise was silent on rate questions or when the power to alter, amend, or repeal the terms of franchises was reversed, could the power to regulate rates or service be exercised by state or local legislatures. In other cases the rates could not be disturbed."¹

During the period of rising costs after 1900, companies made repeated efforts to have rates increased beyond the figure mentioned in the franchise, but to no purpose. Finally, with the rise in costs during the war, com-

¹ GLAESER, *op cit*, p. 225

plete impairment of service was threatened. But the courts remained adamant, although recognizing that it was a "hard bargain" for the companies.¹ On the other hand, companies lost heavily through rate concessions to various influential customers. Commissioner Meyer claimed the whole state of Wisconsin was "literally streaked and plastered with discriminations in the rates of utilities."² In 32 telephone companies 8 per cent of subscribers were receiving free or reduced rates.

Commission Regulation.—Legislative regulation over local utilities came only after 1900 when it was recognized that competition and local control were both ineffective. A thoroughgoing administrative control with continuous oversight was necessary for effective regulation. The mandatory railroad commissions established in the eighties were looked to for regulation of street railways also. Beginning with New York and Wisconsin in 1907, the powers of these bodies were expanded so as to include street railways, interurban lines, gas, water, electric light and power companies, and telephone companies. Some states established separate commissions for the local utilities, but with supervisory powers only. Such was the Massachusetts Gas and Electric Commission of 1885, this state placed telephones under the supervision of the State Highway Commission, which supervised the erection of poles on highways. The movement toward commissions spread with great rapidity after 1907 until today Delaware alone is without a regulating body, the federal government has established commissions for the District of Columbia, Porto Rico, Hawan, and the Philippine Islands. Commissions are provided for in the constitutions of eight states.

The scope of state utility commissions varies widely; in some cases it includes only one class of utilities but the tendency is to lodge control of all utilities with the same commission. In the states of Nebraska, Arkansas, Iowa, Kentucky, Mississippi, South Dakota, and Texas, commissions have control over interurban utilities only, which include telephone, telegraph, express, electric railways, in addition to common carriers and related agencies. Purely local utilities remain under local control. The commissions have been given the power to establish definite rates under legislative standards. Commissions fix standards of service and rates under the ancient rule of reasonableness. Most states prohibit discriminatory rates. In these matters prominent leadership has been assumed by Massachusetts, New York, Pennsylvania, Wisconsin, Ohio, and California.

The Indeterminate Permit.—Legislation establishing rate and service standards and creating commissions has a firm legal basis only in those cases where it does not supersede corresponding arrangements in special

¹ *Columbus Railway Power and Light Company v. City of Columbus*, 253 Fed. 499 (1918), affirmed in 249 U. S. 399 (1919).

² F. L. HOLMES, *Regulation of Railroads and Public Utilities in Wisconsin*, p. 295.

franchises or where state constitutions have reserved the right to repeal, revoke, or amend the franchises. But in cases where municipalities grant franchises where the power to alter them has not been specifically reserved in some manner, state regulation by commission rests upon insecure foundations.¹

State commissions have used the indeterminate franchise as an instrument of control over local utilities.² It recognizes the monopolistic character of the utilities, provides for flexible rates and service, and gives an option to the municipality to purchase at any time at a fair price. The revocable license-franchise of Massachusetts stops short of requiring compensation for the property of the utilities in the street and thus does not give the full protection of the indeterminate franchise. Wisconsin went furthest in this respect. In 1907 it introduced the optional indeterminate franchise but in 1911 found it necessary to revoke all special franchises granted by municipalities in order to secure universal adoption of the former. All franchises granted subsequently by municipalities had to be of that type. "Security of investment so long as service and rates are reasonable is the essence of public policy under the indeterminate permit."³ In Wisconsin the Supreme Court of the state has decided that the municipality has no power to go into business under an exclusive indeterminate permit in competition with the utility company.⁴

Certificates of Public Convenience—Commissions quite generally have been given the power over new utilities in localities where no company has previously operated through the power of issuing certificates of convenience and necessity. This is for the purpose of preventing the investment of capital in a wasteful manner, thus giving the investor assurance against unpromising promotions.

Thus states have accepted the principle that utilities are monopolistic in character and have undertaken their regulation in the interest both of good service to the public and of reasonable compensation to the investor. In the case of telephones, similar legislation applying to unincorporated territory is embodied in the anti-duplication laws, as, for example, the one adopted by Wisconsin in 1913.

Advantages of the Commission System—Commission legislation brought with it state-wide uniformity of regulation which in itself is highly desirable if a multiplicity of details and methods of regulation is to be avoided.

The commissions, moreover, are in continuous contact with the utilities and offer opportunity for the patrons to adjust their grievances.

¹ GLAESER, *op cit*, p 241

² Wisconsin took a leading part in this movement. Other states adopting the indeterminate franchise are Arkansas, Colorado, Indiana, Minnesota, Ohio, and Oklahoma. Likewise, Congress adopted it for the various commissions.

³ *Ibid*, p 244

⁴ *Calumet Service Company v City of Chilton*, 148 Wis 334 (1912)

against the companies. Rates may be fixed by technically efficient bodies whose interest is confined to dealings with both sides concerned. Expensive lawsuits for the redress of individual grievances need not be indulged in.

Legal Status of the Commission.—Legally considered, the commissions are administrative bodies comparable to tax and labor boards. They can determine only facts bearing on the administration of the law.¹ The commissions also have the undoubted power of compelling attendance and testimony of witnesses of access to company records and the like as incidents of their power of investigation. The powers of the commissions are said to be quasi-legislative and quasi-judicial but a usurpation of neither legislative nor judicial power.

Everywhere commission decisions and orders are subject to judicial review. Upon appeal, the court's sole function is to determine whether a constitutional right has been violated and not to substitute court opinion for commission judgment and decision as to facts. The orders of commissions must be obeyed under penalty of criminal liability to fine and imprisonment or civil liability for damages to patrons.

While the power over rates in some states extends only to fixing of maximum figures, most states provide for fixing of absolute rates.

The state commission is made up of three, five, or seven commissioners (one in Washington) appointed generally by the governor for 2 to 10 years, usually 6. Almost one-half of the states still have the elective commission. Commissioners are required to have certain qualifications, they must have no interest in the utilities subject to their control and must devote their entire time to their work. Compensation varies from \$2,000 in Vermont to \$15,000 in New York, with too many states in the lower scale to obtain the highest quality of men. The commissions may act upon complaint by either the utilities or customers, whereupon an investigation is made and followed, if the situation warrants, by a public hearing. In Wisconsin and a number of other states commissions may make investigations upon their own motion. Access to the records of the utilities is given.

Home Rule.—The delegation of state-wide authority to commissions has resulted in a protest from the larger municipalities against absentee control in favor of municipal control, or "home rule" as it is sometimes called. The state commission has removed the utility from political considerations but has rendered cooperation between public authority and the utilities more difficult. The commission is placed in the position of a third party with coercive power.

But the chief argument against local control is economic rather than political or social. Utilities nowadays seldom are confined in their

¹ *Ruggles v. Collier*, 43 Missouri 353 (1869), *Minnesota, St. Paul, and Sault Sainte Marie Railway Company v. Wisconsin Railroad Commission*, 136 Wis. 146 (1908).

operations to a single municipality. Some authorities favor a combination of both local and state control. Some constitutions provide for home rule, as in the case of Denver, or for vote by the people in the adoption of franchises. In a number of states, Arkansas, Texas, Iowa, Kansas, Kentucky, Michigan, Minnesota, and Nebraska, local regulation remains for important utilities. In other states authority between local and state bodies is divided. Los Angeles, Kansas City, and St. Louis all experimented with local commissions but in each case their powers were only of an advisory nature. The commissions of the last two cities have been succeeded by the Missouri Public Service Commission.

The solution seems to lie along the line of retaining the commissions with their administrative powers in addition to rate agreements between local authorities and the companies in the more important municipalities. A number of states at the present time are proceeding along this line.

Sliding-scale Franchises—The commission system of rate control has been widely adopted in the United States. A number of cities, among them Milwaukee and Boston, have preferred to exercise control over rates through local agreements with the companies based upon adjustable rates. The precedent for this goes back to England in her experiments with gas companies. The first expression of this was the "official revision system," which limited rates so that net revenue would not exceed requirements for the reserve fund allowed by law and dividends. Upon complaint of two customers the Court of Quarter Sessions was empowered to compel such adjustments based upon the earnings of the current year. This required frequent action and overburdened the courts. Besides there was no control over capitalization, while costs were assessed against the complaints in case of failure to win the case.

England's next step in regulation of gas rates was the establishment of an automatic "sliding-scale system," whose adoption is voluntary on the part of the companies. Although first provided in the Gas Act of 1855, it was little adopted before 1875. It has grown very rapidly since then and now constitutes the system in force in over one-half of Great Britain, including London. The sliding-scale system as employed in London provides a standard price for gas and a standard dividend; for each penny reduction in the price of gas, dividends may be increased one-fourth of 1 per cent above the standard and *vice versa*. The central ideas in this arrangement are to cultivate better relations with consumers and to provide incentive for good management. The sliding-scale system has been extended to some electric light and power companies.

In 1876 the auction method of selling stock to raise capital for improvements was adopted in London and has since become general in England. It provided for an upset price of the stock controlled by the Board of

Trade. If no bid was received equal to the upset price, the stock was then to be offered to stockholders at that price.

Boston introduced an optional sliding-scale system for gas in 1906. It started with a standard price for gas at 90 cents per 1,000 cubic feet and a standard dividend rate of 7 per cent. For each reduction of 5 cents in the price of gas the company is allowed to increase the dividend 1 per cent during the following year. After providing for a reserve fund equal to 5 per cent of the capital stock, excess earnings were to be returned to the towns in proportion to the number of miles of gas mains laid. The Board of Gas and Electric Light Commissioners was given the power to change the standard price of gas after 10 years to conform to changes in cost of production and taxes. The Board also was empowered to fix prices of new stock issues which then may be sold at auction or to stockholders.

As long as prices and costs including taxes remain fairly stable, the system will work and have considerable merits; but rapid changes in this situation will render it unworkable. Aside from the difficulty of establishing an initial standard rate for gas, changes in the rate itself are likely to meet with opposition from either the customers or the companies, depending upon which side is favored. Fundamentally, like the English system, it provides incentive for efficient management. Its success, however, is limited by its ability to reduce gas prices, which may not proceed beyond a certain point under prevailing conditions. The system's popularity waned after inflation of prices incidental to the war in favor of the service-at-cost franchise.

Service-at-cost Franchise.—The latest development in regulation is the service-at-cost franchise. This system provides for rapid adjustment of price to changes in the cost of rendering service and is favored widely by both the utilities and the public. It was approved by the Federal Electric Railway Commission of 1920. The city of Cleveland took the lead in 1910 in working out the plan, but not until after 1917 when inflation became pronounced did it receive wide adoption. This rise in prices placed electric railways in a precarious position in view of the 5-cent fare agreements. It became imperative to adopt some change if service was to be continued. The service-at-cost principle was adopted in succession by Cleveland, Dallas, Boston, Cincinnati, Memphis, Rochester, Toledo, Pittsburgh, Des Moines, Louisville, and so forth. The system has as its chief aims the protection of the capital invested through securing a fair rate of return and providing the public with satisfactory service at cost. The plan usually provides for the purchase of property at any time by the municipality at a stipulated price. Rates are fixed upon a valuation base agreed upon with some adjustment for depreciation. An automatic sliding scale of fares based upon cost is provided for or the power of adjustment delegated to a local authority.

Local officials are given the power to prescribe standards of service and extensions.

The service-at-cost principle operated first in favor of the railways. But with the trend of prices and costs downward it is in the interest of the consumer only that rates be adjusted according to this principle. When viewed in its entirety, this principle represents the goal toward which regulation everywhere is now proceeding. Emphasis is placed upon earnings sufficient to attract capital for the enterprise and at the same time to limit the profit to a reasonable return on the investment. It contemplates a monopolistic condition, a position to which the public as well as legal and judicial authority is fully committed.

The Milwaukee Agreement.—The city of Milwaukee and the companies serving its territory with transportation, electric light, power, and heat, embracing the properties of the North American Company, reached an agreement (effective in 1925) embodying the service-at-cost principle. The chief features of this agreement may here be recited.

The contract runs for 10 years and is automatically renewed at the end of each 10-year period unless terminated by popular vote 2 years before the expiration of the period. An initial normal value as of January 1, 1914, on the principle of cost of reproduction new—a figure closely approximating the actual cost of the property—was assigned the properties. All additions of capital expenditure subsequent to this time were added to this value at cost. Deduction for abandonments and replacements at values assigned as of 1914 for property then owned, or at cost if subsequently acquired, was required. The result thus obtained provided the rate base. This conforms to the standard of valuation embodied in the so-called "prudent-investment" theory. Valuations thus arrived at and approved by the city cannot afterwards be contested by the city. To the values thus obtained, a further addition for working capital is allowed which represented the final rate base and the price at which the city could at any time purchase the property.

The cost of service included all operating expenses, taxes and rentals approved by the authorities, allowances for operating and insurance reserves, for depreciation, and for a return upon the investment. Initial return on capital was set at 7.5 per cent for railway property and 8 per cent for electric and heating properties—figures which corresponded with those set by the Railroad Commission in similar cases. Return in the future was to be modified according to the current cost of capital to be determined by a formula which makes allowance for the risk element assumed by the stockholders as well as changes in the interest rate, cost of amortizing bond and note discount, and selling expenses. A depreciation reserve was originally fixed at the amount accrued as of the date of the contract. An annual depreciation charge thereafter was fixed at 2.82 per cent of the current value of the fixed property.

Interest on the depreciation reserve is allowed which with interest on operating reserves constitutes a deduction from the rate of return. Rates for service were to be changed to correspond with changes in net reserves.

This plan thus adopted the going-concern point of view, a stabilized rate base representing the principle of historical cost undiminished by the amount of the accrued depreciation, and an automatic adjustment of the rate of return in accordance with current capital costs.¹

The Dilemma of Regulation.—The central fact of regulation is the limitation of profits on the capital invested. But, very early, difficulties were encountered in the ascertainment of the amount of capital upon which a return was to be allowed. The valuation of local utility property seemed to be connected in its early stages with valuation for tax purposes. In 1900 Michigan and in 1903 Wisconsin enacted laws taxing railroads on the basis of their physical valuation, the roads being considered as a unit in the valuation. In 1905 and 1907 Wisconsin and New York passed laws regulating both railroads and local utilities and empowered the commissions to make valuations for rate-making purposes.

Everywhere when valuation was attempted for rate-making, or even for tax purposes, the avenues of information seemed to be blocked by loose accounting methods. Watered stock was a universal evil (except in Massachusetts) and balance sheets were constructed so as to give effect to this fictitious capitalization. The natural course of procedure in this situation was to trace the financial history of the utility to discover the actual investment in the property. But here again the obstacles were insuperable. In many cases even the records of the past were nowhere to be found. Scarcely any utilities, following the custom of railroads, had kept even the semblance of a depreciation account or had made a distinction between operating expenses for repairs and replacements and capital outlays. One source only remained to the commissions, namely, the method of cost of reproducing the property. This method of valuation was from the first seized upon as the only alternative open in the search for a valuation which could serve as a rate base. If the cost of the separate units of the property could be ascertained through the efforts of engineers, the summation of the various parts would yield a physical valuation. The pursuit of physical valuation on a reproduction basis henceforth occupied the attention of federal and state commissions and still remains as one of the most troublesome problems connected with rate-making.

The Legal Doctrine of Valuation.—Ever since the doctrine of judicial review was promulgated by the Supreme Court, it devolved upon this court in particular, and all courts in general, to interpret the term "reasonable rates" for utilities. The doctrine of valuation as the basis of

¹ See GLAESER, *op cit*, Chap XXV

reasonableness was first adopted in 1896 when a lower federal court said "it is the actual value of the property at the time the rates are to be fixed that should form the basis upon which to compute just rates"¹ This doctrine was enunciated and elaborated by the Supreme Court in the well-known case of *Smythe v Ames* in 1898 This case forms the landmark for valuation decisions down to the present time and represents accepted doctrine today in both railroad and utility valuations

In this rule of valuation are embodied the principles of valuation according to which the actual or historical cost of the tangible property, the amount and market value of the stocks and bonds outstanding, and the reproduction cost of the property are based These elements are to be combined in such a way as seems "just and right in each case" As explained in the *Minnesota Rate* cases, no formula was to be used but the rule was intended to be flexible, leaving a large measure of discretion to the commissions and courts

It was soon appreciated that the market value of stocks and bonds was the capitalized earning power of the utility and as such could not be used without circular reasoning This narrowed down the process of valuation either to historical or actual cost of construction, or to reproduction cost But the former, as we have already seen, was in most cases impossible of ascertainment and the courts fell back mainly upon reproduction cost or present value

Appraisal of Property—Appraisal consists essentially, first, of making an inventory of property, second, the determination of unit prices, and, third, the summation of all the units of property to be valued. The appraisal value, strictly speaking, includes only the property devoted to the public service.

To the values found by this method, sometimes when contractors were employed, an additional 10 per cent is added for contractor's profit Appraisal practice usually makes the following allowances for detailed overhead charges² A usual figure for complete overhead charges is

	Per Cent
Interest, taxes, and insurance during construction	6 to 12
Engineering, superintendence, and administration	3 to 10
Organization and legal expenses	3 to 5
Omissions and contingencies	1 to 3

15 per cent, the figure varying inversely as the size of the undertaking Inventories of materials and supplies complete the list of property valuations

Valuation Standards.—But appraisal does not constitute valuation, which considers the relative emphasis to be placed upon various elements. The doctrine of fair value worked well with reference to the past

¹ *San Diego, etc., v Jasper*, 74 Fed 79 (1896)

² GLAESER, *op cit*, p 448.

where there was a large measure of discretion but rate-making is essentially a problem of the future. This brought the cost-of-reproduction principle into conflict with the investment standard. As long as the results obtained by calculation of past investment and the present reproduction cost of the property did not diverge widely, the courts and commissions managed to reconcile their differences. But when price changes became pronounced, the two principles were utterly unreconcilable. For a while in order to limit the short-time fluctuations in price, the principle of adopting average prices over a period of 3 or 5 years became general. With the rise of prices incident to the war, jurists called attention to a "new plateau" of prices which raised insuperable obstacles to the fair-value rule. It should be stated here that in the later nineties, at the end of the long period of falling prices, consumers argued constantly for the reproduction-cost principle, since this would reduce that rate base and so reduce rates themselves.¹ But when prices reversed themselves and advanced mostly rapidly, consumers reversed their position and the utilities were arguing for this principle. More recently the current has swung back again to its original position in the face of rapidly declining prices. By far the largest portion of capital now represented in local utilities represents an investment during or since the war upon a relatively high price level. Against this property there are outstanding the stocks and bonds of the utilities upon which a reasonable return is claimed and upon which the credit of the companies rests.

In the ascertainment of present value, the principle of cost of reproduction has possessed special fascination for the courts because it seems to approach most nearly to the concept of sale or exchange value, the commonly accepted meaning of the term "value." The fundamental objection to this principle in regulation is that it does not represent the principle embodied in the cost-of-service standard. In times of high prices it results in a value far above the cost of service and in periods of low prices it produces a result far too low. Consequently, should reproduction cost be the predominating principle in valuation, the substantial drop in commodity prices recently experienced would cause great injury to bondholders and stockholders in utilities as compared with investors in other enterprises.

In the face of experience with price changes, the flexible rule in *Smythe v Ames* has shielded the courts well. Commissions have usually worked upon the basis of the "split standard," that is, a combination of the investment and the cost-of-production standards. On properties constructed before the war, normal reconstruction costs as of pre-war date were applied. To property constructed during and after the war, values were based upon current prices or the actual cost of the property as shown by the records. The Interstate Commerce Commission attempted

¹ W. J. Bryan argued on this side of the question in *Smythe v Ames*.

to apply these principles in the O'Fallon case. The Supreme Court, leaning on the wording of the Transportation Act of 1920, reminded the commission that the "law of the land" called for present values.

The decision of the Supreme Court in the Southwestern Bell Telephone case went far toward establishing the cost-of-reproduction theory as the sole basis for valuation in rate cases. This case also added the idea of futurity to valuation. The language of the court is as follows: "An honest and intelligent forecast of probable future values made upon a view of all the relevant circumstances is essential. If the highly important element of present costs is wholly disregarded, such a forecast becomes impossible. Estimates for tomorrow cannot ignore prices of today."¹

In this case the court required that the commission's valuation be scaled up "at least" 25 per cent. How much more should be allowed is not stated, although it was recognized that, to make due allowance for advance in the price level, 45 or 50 per cent would be necessary. In the Indianapolis Water Company case the court was even more emphatic in its insistence on reproduction cost as the predominating consideration.²

Although the courts insist upon the principle of reproduction cost, following 1920 commissions almost universally either disregarded it entirely or gave it only minor weight. Out of 365 cases reported in *Public Utility Reports Annotated* from the beginning of 1920 to March 1, 1923, in all but 5 the commissions neglected this element of value entirely or gave it only small weight. In only five cases was it the predominating factor. The reason for this almost universal disregard of reproduction value is that such a valuation unduly enhances the rate base beyond the actual cost of the property and results in greatly increased revenues to the corporations.

Competitive Cost the True Principle.—It has been seen that historically it was the presence of the monopolistic element, and the consequent position of dependence into which it placed the patrons of the enterprise, that formed the economic basis of the legal argument for regulation. This idea was reinforced by the practice of chartering of companies engaged in this field of enterprise and circumscribing their privileges. Rates were regulated on the basis of what competition would reasonably bring about. Competition too was identical with the cost of producing the service.

¹ In *Wilcox v. Consolidated Gas Company*, 212 U. S. 19 (1909), the court had already taken the position that "if the property which legally enters into the consideration of the question of rates, has increased in value since it was acquired, the company is entitled to the benefit of such increase."

² *John W. McCordle et al. v. Indianapolis Water Company*, 47 Supreme Court Records 144 (1923).

A competitive standard is a cost standard. Where two or more producers are competing for the sale of the same article, and that article is capable of being reproduced in unlimited quantities, the price will tend to settle at the cost of production. This, however, is not the cost to the marginal or high-cost producers, as is often erroneously imagined; it is the cost to the most efficient producer who in time increases the volume and reduces the price of his product to the extent that inefficient producers whose costs exceed the price are driven to the wall. The result is that the least cost in the long run becomes the standard or competitive cost, and the public gets the service upon the best terms possible. It is this cost-of-service principle that regulation is striving to preserve. Regulation, however, must not be so parsimonious as to dry up the sources of capital or put a damper upon personal incentive, the penalty of which is ultimately inadequate and costly service.

The ingredients of a competitive cost price may be classified as wages of labor and management, cost of raw materials and supplies, taxes, and capital charges. The economic problem of public-utility regulation is largely the problem of meeting competitive wages of labor and management, competitive costs of materials and supplies, taxes, and a competitive return to the capital invested. All of these costs, except taxes, are presumably determined to a large extent by competitive conditions in industry at large. Likewise, materials and supplies are purchased for the most part in a competitive market.

Even to a greater extent than wages, materials, and supplies, the return to capital is determined by competitive conditions. No market is so free from artificial or natural hindrances to free choice as the capital market. Capital flows freely to the point of least resistance or greatest return. All that capital demands in the public-utility business is a return comparable with that received by capital invested in competitive enterprise, after making due allowance for the risk involved in each case. This principle will insure that the public-utility industry will always be able to attract its proportionate share of current capital funds. This great principle of natural regulation apportions capital, as also labor and supplies, to the various points in the general field of economic enterprise where the need is greatest and thereby produces a balanced industrial system. This is the ideal after which regulation should and in the end must strive if the public is to be supplied with the service demanded and if the growth of public utilities is to keep pace with the general growth of the country. A return sufficient to attract a due proportion of current capital funds to the public-utility field may be regarded as the *sine qua non* of regulation.

Land Valuation.—In the valuation of land for rate-making purposes two rules prevail. In districts where the actual or prudent investment principle of valuation holds sway, the Massachusetts rule applies. This

rule requires only that the actual or prudent cost of the land be included. But in districts where the reproduction-cost principle for structural valuation prevails, and with the federal courts generally, the principle of market value for land is universally applied. In West Virginia the actual cost of investment was taken as the starting point with possibly some allowance for appreciation¹. On the other hand, the Pennsylvania Supreme Court and the Appellate Division of the New York Supreme Court rejected actual cost and applied market value unequivocally².

In cases where the utility has given value to surrounding lands, the tendency of commissions and courts is to allow the vicinity value to prevail. On the other hand, where land values have been enhanced or degraded by the character of the buildings or structures, the value of adjacent lands is used.

Working Capital.—No rate case involving working capital seems to have come before the Supreme Court³. Other courts, however, as well as commissions, have had to deal with this question. Since this item is generally a variable one it has become customary to take averages rather than values as of a specific date⁴.

Valuation and Accrued Depreciation.—The rule of valuation laid down in *Smythe v. Ames* omitted any mention of depreciation. In fact the problem of depreciation had not emerged in engineering discussions prior to 1900. It was not until 1909 that the Supreme Court added this element to the process of valuation for rate-making purposes. In the *Knoxville Water* case, the court, although recognizing the difficulty of accurate calculation where the separate parts of a physical plant are of unequal service life, nevertheless, made it clear that "some substantial allowance for depreciation ought to have been made in this case"⁵. The court distinguished between complete and incomplete depreciation. Complete depreciation resulted from "the growth of the city, or necessary changes in the operation of the plant, or in consequence of deterioration from natural causes of wear and tear" where the part has been completely abandoned and the value "completely gone out of the plant." Incomplete depreciation "is where, in consequence of wear and tear from natural causes, parts of the plant are undergoing injury and are on the way to complete destruction, but are still in use." This is regarded as the leading case in depreciation, and there is recognition of the principle of depreciation in rate-making on account of deterioration, and apparently of inadequacy and obsolescence, both of which

¹ *Natural Gas Company of West Virginia v. Public Service Company*, 95 W. Va. 557 (1926).

² *Davis v. Pennsylvania Gas Co.*, P. U. R., 1921 B, 342 (1920).

³ R. H. WHITTEN, *Valuation of Public Service Corporations*, Vol. II, p. 1525.

⁴ *Ibid.*, pp. 1519-1525.

⁵ *Knoxville v. Knoxville Water Company*, 212 U. S. 1 (1909).

are aspects of functional depreciation. The inclusion of depreciation in valuation was definitely required as late as 1927 in the Indianapolis Water case.¹ In the Minnesota Rate cases,² the court clearly recognized "existing depreciation in the plant as compared with the new one" as distinct from "that which has been overcome by repairs and replacements" and went on to say that "this amount should be found and allowed for. If this is not done, the physical valuation is manifestly incomplete."³

Theory of Accrued Depreciation.—As to the existence of accrued depreciation there can be no question. Weather and use undoubtedly are destructive forces which in the end will obliterate all capital. Just as truly does functional depreciation from inadequacy and obsolescence finally lead to the same result in large portions of invested capital. It may be added also that governmental requirements for improvement in service and safety, or otherwise, render much property of no further use. In all of these cases, capital value is surely lessened to the extent of the depreciation and the rule of the Supreme Court would seem to be logical and economically sound. Moreover, it should logically make no difference whether valuation is based upon cost of reproduction or investment cost. Depreciation should always be expressed in terms of percentage of value, since it is the proportion of expired to estimated service life that measures the extent of depreciation. Where reproduction cost is used in valuation, percentage depreciation operates unfavorably to the investor in rising costs of production and favorably in falling costs. This, however, is not basic to depreciation itself but is a result consequent upon this particular method of valuation.

The investment problem itself is bound up with the problem of depreciation. If the original investment is to remain intact (assuming stable costs), the depreciated portion of the value of the property must be made good out of the accumulation of earnings. This can be accomplished practically in only two ways, either by the building up of a surplus or by the creation of a depreciation reserve account in the balance sheet. Sound accounting demands the latter alternative.

Important cases are on record where no deduction for depreciation was allowed in deciding reasonable rates. For instance, the Massachusetts Commission in the Blue Hill Rate case allowed a valuation equal to the investment in the property on the ground that "the failure to make provision for depreciation and the virtual loss of invested capital caused thereby cannot justly be ascribed to mismanagement."⁴ Earnings

¹ *McCardle v Indianapolis Water Company*, P U R, 1924 B, 306

² 230 U S 352

³ Depreciation on account of deterioration and obsolescence was also approved in the Des Moines Gas case, 238 U S 153 (1915), in the Denver Union Water case, 246 U S 178 (1918), and in others.

⁴ 3 Massachusetts Public Service Commission Reports 52 (1915).

were in fact so low that no dividends whatever had been received. This appears to have been an unusual case, resulting from failure to reduce earnings sufficiently to pay cost of operation, including depreciation. The general rule followed was stated in the Springfield Rate case, where the commission seems to have guided its action in view of the prudent investment basis of valuation.¹ It pointed out that, where the cost-of-reproduction principle was followed, allowances for appreciation in land values and certain other items, and for going-concern value, it was appropriate to make deduction for depreciation as an offset to these values.

But this method was unequivocally condemned in the Minnesota Rate cases. It seems more conservative and sounder economically to maintain the integrity of the investment through a depreciation reserve built up out of earnings to replace the original investment when the service life of the property has been exhausted. It is not sufficient that earnings cover interest and dividends while ignoring provision for the maintenance of the capital intact. This would plainly ignore the property basis of credit found in all first-class corporation bonds. Public-utility bonds without adequate property basis would suffer in competition in the investment market with the more favored issues.

Depreciation a Cost of Service—It is well established in law that accruing depreciation is a cost of service, the same as expenses of operation, taxes, and interest on capital. Utilities are enjoined by the Supreme Court of the United States

. . . to see that from earnings the value of the property invested is kept unimpaired, so that at the end of a given term of years the original investment remains as it was at the beginning. It is not only the right of the company to make such a provision, but it is a duty to its bondholders and stockholders, and, in the case of a public service corporation at least, its plain duty to the public.²

Where a depreciation reserve has been set up equal to the permanent depreciation in the property and invested in improvements or expansion of service, certain commissions deduct the amount of the reserve from the valuation of the entire property investment. This results in a rate base equal to the historical or actual investment in the property and corresponds to the obligations of the company plus its stock (if not watered), neglecting surplus accumulated out of earnings. This rule is followed in the New York Telephone Company case.³ But the commission was sharply rebuked for taking this position by the United States District Court⁴ on the ground that the depreciation shown on the books was a mere bookkeeping device and that actual depreciation must be

¹ 6 Massachusetts Public Service Commission Reports 211 (1918).

² *Knoxville v. Knoxville Water Company*, 212 U. S. 1 (1909).

³ P. U. R., 1923 B, 545.

⁴ *New York Telephone Company v. Prendergast*, 300 Fed. 822 (1924).

determined by examination of the property concerned. The commission afterwards found the actual depreciation was the equivalent of that appearing on the books of the company and authorized the company to raise rates on this finding.¹ The position of the Supreme Court on this question was stated in 1909 in the *Cumberland Telephone and Telegraph* case.² The court sanctioned the deduction of the amount of the depreciation reserve from the total valuations to the extent that the reserve was reinvested in the plant. No subsequent case can be found where the Supreme Court modified the position taken in this case.³

Retirement Reserve.—A third method of treating depreciation seeks to steer a middle course between the rule of the Supreme Court and the Interstate Commerce Commission, on the one hand, and the Massachusetts rule of the other. It is sponsored by the National Association of Railway and Utilities Commissioners for gas and electrical utilities and has the approval of the Engineering Society. In its Uniform Classification of Accounts, the term "depreciation" does not appear but instead the terms "retirement expense" and "retirement reserve" are used. The purpose of the retirement accounts is that

corporations may, through the creation of adequate reserves, equalize from year to year, as nearly as is practicable, the losses incident to important retirements of buildings, dams, and so forth, or of large erection of continuous structures like electric lines, or of definitely identifiable units of plant or equipment. "Losses" used above means in each case the excess of the original cost to the accounting company of the property retired plus the cost of dismantling or removing, over its salvage value at the time of its retirement.

The reserve may be created either out of earnings or from appropriations from surplus.

The retirement reserve is merely a deferred expense accumulated in sufficient amount to replace all units at the time of their retirement. It is solely the size of the unit in replacement that renders a reserve necessary. Its nature is essentially the same as a maintenance and repair expense but, owing to the irregular character and exceptional amount necessary for replacement of these units, it is deemed best to equalize the expense over several years' time. Where properties are large and have struck their gait, these replacements occur with a measurable degree of regularity and the reserve need be of only moderate proportions. But where the plant is small, the retirement reserve approaches in amount the depreciation reserve. Replacements may

¹ *Re New York Telephone Company*, P U R, 1926 E, 1.

² *Railroad Commission of Louisiana v Cumberland Telephone and Telegraph Co.*, 212 U S 414 (1909).

³ R. H. WHITTEN, *Valuation of Public Service Corporations*, 2d ed., Vol II, pp. 1683, 1928.

thus be made as needed, in which case the ability of the property to render service need never be impaired

But this method of treating depreciation completely ignores accrued or permanent depreciation and provides nothing against the loss in service-life of the plant nor does it maintain the investment intact. Moreover, it does not provide funds to cover the entire cost of the service to the consumer. As remarked by Whitten: "Both the accounting rule that omits accruing depreciation from operating expenses and the corollary that would deny the existence of accrued depreciation in a valuation for rate purposes seems to run sharply counter to the facts, to sound reasoning and to the rules of law announced by the Supreme Court."¹

Basis of Computing Depreciation.—The question arises as to the proper basis of calculation of the annual depreciation charge. The Supreme Court has not spoken definitely on this point. In the *Knoxville Water Company* case it did speak of keeping the investment "unimpaired" and "as it was in the beginning." This was interpreted in a case² in 1924 by a standing master to mean the historical cost as a basis, notwithstanding that the Supreme Court had just previously used language³ which seems to imply that the present value of the property should be used. Important state commissions favor the view taken by the standing master. The Indiana Public Service Commission in 1925 said, "The base upon which to calculate the annual depreciation fund should be the actual cost of the depreciable property."⁴ So the Missouri Public Service Commission in the same year declared "the purpose of a depreciation reserve is to retire the investment in depreciable property at the end of its useful life. The depreciation reserve is a retiral reserve and not a replacement reserve. Consequently, any estimate of the annual depreciation requirement should be based upon the investment in depreciable property."⁵ The excess of the cost of the new, over the cost of the old, unit was properly a capital charge. The Illinois Commerce Commission⁶ and the Wisconsin Railroad Commission⁷ took a similar position.

In matters of this kind, next to the Supreme Court itself, the Interstate Commerce Commission may be regarded as the highest authority. With reference to depreciation charges of telephone companies and railroads, it said in 1926, "It is agreed by all that depreciation expense should

¹ *Op cit*, Vol II, p 1824.

² *Georgia Railway and Power Co. v. Railroad Commission*, P U R, 1925 A, 546 (1924)

³ In the same case, 262 U S 625 (1923).

⁴ *Re Indianapolis Water Company*, P U R, 1925 C, 431 (1924).

⁵ *Re Capital City Water Co*, P U R, 1925 D, 41 (1925)

⁶ *Re Rockford Electric Co*, P U R., 1925 D, 154 (1925)

⁷ *Marquette v City Water Co*, P U R, 1926 B, 362 (1925)

be based primarily upon the original cost to the accounting company of the unit of property in question " It went on to compare this with other operating expenses, such as the consumption of coal In prescribing a system of uniform accounting for telephone companies, the commission was in agreement with the accountants of the American Telephone and Telegraph Company on almost all important matters and adopted the original cost as the basis for calculating accruing depreciation

Nevertheless, certain courts and commissions have held the opposite view, requiring depreciation charges to be based upon present or reproduction value Such was the position of the United States District Court of Kentucky,¹ the Supreme Court of Michigan,² the Ohio Public Utilities Commission,³ and the Kansas Commission,⁴ whose findings were approved by the Kansas Supreme Court

Summary of Supreme Court's Position.—In his work on *Valuation of Public Service Corporations*, Robert H Whitten summarized the position of the Supreme Court on depreciation as follows

Beyond question the United States Supreme Court has said that, in general, physical property in utility service, other than land, is subject to deterioration and loss of value from the moment that it is put in service, that depreciation representing this loss of value from whatever cause is a factor tending to establish fair value at a lower figure than the cost new of the property, that depreciation as it accrues is an expense which should be charged to operation and provided for in the rates collected from the consumer, that if a utility neglects to collect sufficient rates from its patrons to cover this portion of the cost of operation, the fault is its own and when it comes to a valuation for rate purposes under conditions which bring the question into the federal courts, the company's failure to provide for depreciation will not be accepted as a circumstance tending to make the fair value of the property as the rate base any greater than it otherwise would be, that the amount of depreciation to be deducted from cost new in arriving at fair value for rate purposes is actual as distinguished from purely theoretical depreciation, and that as the failure of the company to collect a sufficient amount for depreciation in the past does not give it the right to claim a larger allowance in the present, so, if the company has collected excessive amounts in the past, this excess cannot be used by the regulatory authority as an offset to current depreciation requirements to any extent⁵

In addition to these general principles upon which the court has spoken, several other important principles seem to be sound. Depreciation reserves accumulated under public authority and invested in utility

¹ *Re United Fuel Gas Co v. Railroad Commission*, 13 F (2d) 510 (1925)

² *Michigan Public Utilities Commission v Michigan State Telephone Co*, 228 Mich 658 (1924)

³ *Re Cincinnati and Suburban Bell Telephone Co*, P U R, 1924 E, 849 (1924).

⁴ *Hopkins v Southwestern Bell Telephone Company*, 115 Kan 236 (1924)

⁵ Vol II, p 1871

property may be deducted from the value of the entire property, including that built from the reserve fund, in finding a rate base, except only if actual depreciation is substantially less than the reserve. Accrued depreciation can best be determined by examination of the property instead of by inspection or observation, or by life tables. The age-life, straight-line method is the simplest and best method of calculation. Annual depreciation is a factor of book cost whether that represents original cost or fair value or reproduction cost.¹

Rate of Return.—Consideration of reasonable rates usually begins with *Smythe v Ames*.² In this case the Supreme Court laid down the principle that a "fair return" on the "fair value" of the property was a measure of "just compensation" for services. Reasonable rates to the individual consumer have no necessary or proportionate relation to reasonable return on the amount of the property to the investors. The economic law of demand under changing rates may in fact produce opposite movements in the rate of return on the capital invested. This depends entirely upon the degree of elasticity of demand under changing rates.

The Supreme Court spoke positively in the *Bluefield Water* case when it said, "Rates which are not sufficient to yield a reasonable return on the value of the property used at the time it is being used to render the service are unjust, unreasonable and confiscatory."³ This seems to establish the rule that rates of charge are unreasonable and confiscatory to the utility if they fail to yield a reasonable return on the value of the property. Rates which yield less than this may, nevertheless, from the standpoint of the consumer be just and reasonable.⁴

In some of the earlier cases considered by the commissions, a distinction was made between a rate of return that was barely non-confiscatory and one that was reasonable. The distinction was made under certain state laws which looked toward the future expansion of the utility and the need for large amounts of additional funds that had to be raised from the public. Out of public policy the need for a return somewhat more liberal was recognized in providing adequate service at all times. Some of the federal courts recognized this distinction but stated that an allowance beyond the reasonable return was purely a matter of legislative policy, the courts being interested only in preventing confiscation of property through low rates.⁵ In deciding what is a reasonable rate of return, the

¹ Cf. WHITTEN, *op cit*, Vol II, pp 1872-1874

² 169 U S 466 (1896)

³ *Bluefield Water Works and Improvement Co v Public Service Commission of West Virginia*, 262 U. S 679 (1923)

⁴ See WHITTEN, *op cit*, Vol II, p 1886

⁵ *Louisville and Nashville Railroad Co v Silver*, 186 Fed 176 (1911), *Contra Costa Water Co v City of Oakland*, 159 Calif 323 (1911), *Duluth Street Railway Co v Railroad Commission*, 161 Wis 245 (1915), *Ann Arbor Railroad Co v Fellows*,

Supreme Court laid down the rule in 1909 that this rate depends on the facts of the individual case. It pointed out that the factors of risk, locality, and rate of return on similar investments were recognized as being of great weight.¹ Subsequent decisions of courts and commissions² were made with reference to this case and took account of numerous individual factors. In these cases prominent among the various factors that affect the reasonable return in individual cases are the financial history of the company, the extent to which cost of promotion and going value have been included in the rate base, inherent stability of the industry, future prospects, local interest rates, return on other forms of invested capital in the same community, efficiency of managements, character of service rendered, and income taxes paid by the company. Especial consideration was given to increase in construction costs and interest rates incident to the war.³

The leading case was the *Bluefield Water* case, where the Supreme Court emphasized the necessity of maintaining the credit of the utility through fair return on the capital invested.⁴ In the *Indianapolis Water* case⁵ the Supreme Court seems to have departed from the rule laid down in the *Consolidated Gas* case and followed in numerous other cases. In this case it emphasized the general money market and broad investment conditions rather than the local situation. It is undoubtedly true that utilities nowadays ramify physically into many communities and over extended areas and are financially tied up with holding companies which furnish a large portion of the capital needed in the enterprise. These facts require a modification of the rule as originally laid down by the court. It is the opinion of Whitten⁶ that this decision does not abrogate the original rule as laid down in the *Consolidated Gas* case.

Recent Trends.—In the *Bluefield Water* case the court laid down the rule that the rate of return on invested capital was confiscatory unless it was high enough to attract new capital to the enterprise.

The present tendency of the courts seems to be in the main to obliterate the distinction between a merely non-confiscatory rate and a rate that as a matter of

236 Fed. 387 (1916), *Garden City v. Garden City Telephone, Light and Manufacturing Co.*, 236 Fed. 693 (1916), *Columbus Gas* case, 17 F. (2d) 630 (1927), *Waukesha Gas and Electric Com. v. Wisconsin Railroad Commission*, 181 Wis. 281 (1923).

¹ *Willcox v. Consolidated Gas Co.*, 212 U. S. 19 (1909).

² *Cedar Rapids Gas Light Co. v. City of Cedar Rapids*, 144 Iowa 426 (1909), *Des Moines Water Co. v. City of Des Moines*, 192 Fed. 193 (1911), *Des Moines Gas Co. v. City of Des Moines*, 238 U. S. 153 (1915); *Denver v. Denver Union Water Co.*, 246 U. S. 178 (1918).

³ *Lincoln Gas and Electric Co. v. City of Lincoln*, 250 U. S. 256 (1919), *Galveston Electric Co. v. Galveston*, 258 U. S. 388 (1921).

⁴ *Bluefield Water Works and Improvement Co. v. Public Service Commission of West Virginia*, 262 U. S. 679 (1923).

⁵ *McCardle v. Indianapolis Water Co.*, P. U. R., 1924 B, 306.

⁶ *Op. cit.*, Vol. II, p. 1944.

public policy would be regarded as fair and just, and to forget the oft-repeated rule that the courts will not set aside a legislative act, such as an order fixing rates, unless it is clearly and beyond doubt unreasonable.¹

Moreover the trend in recent decisions has been toward higher rates of return. A United States District Court in Arkansas approved a rate of $7\frac{1}{2}$ per cent, although it stated that a rate of 5 per cent would not have been confiscatory.² So the decision in the Consolidated Gas case in the United States District Court of New York allowed a rate of return of 8 per cent on the valuation. The special master explained carefully that the return was not on bonds and stock as such but on the property and that the payment of dividends was immaterial to the case. The court even went so far as to say, "Indeed, according to all successful business experience, a corporation paying out in dividends all or even the major part of its net earnings is courting a speedy disaster."³

The federal district court in Idaho,⁴ after referring to the general range of allowance of 6 to 8 per cent, approved a rate of 7 per cent for a power company, stating that the risk involved was not great and that that rate would be sufficient to attract capital. Especially interesting is the decision of the California Railroad Commission in the San Jose Water case.⁵ Here the company had shown especial skill in financial and business management which led the commission to say, "To penalize a public utility for efficiency and economy in management and operation could result only in placing a premium upon extravagance." Such cases as this reveal an understanding and appreciation on the part of public regulatory bodies of the value of sound business principles. The Illinois Commerce Commission fixed a rate of 7 per cent as reasonable for an electric company in 1925.⁶ The North Dakota commissioners⁷ allowed a rate of 8 per cent for an electric company in the same year. The Nebraska State Railway Commission allowed a return of 7 per cent in the case of the Omaha and Council Bluffs Street Railway.⁸ In Massachusetts the Department of Public Utilities approved a rate of 6 per cent for an electric company in Worcester on the ground that such a rate was a very attractive one on money invested in Massachusetts.⁹

Many telephone cases have been decided within recent years involving rate of return on valuations. In New York the Public Service Commis-

¹ WHITTEN, *op cit*, Vol II, p 1953

² *Arkansas Water Co v City of Little Rock*, P U R, 1924 C, 73 (1923)

³ *Consolidated Gas Co v Prendergast*, 6 F (2d) 243; P U R, 1925 B, 773 (1925) and P U R, 1925 C, 744 (1925)

⁴ *Idaho Power Co. v Thompson*, 19 F (2d) 547 (1927)

⁵ *Re San Jose Water Works*, P U R, 1925 C, 370 (1924)

⁶ *Re Rockford Electric Co*, P U R, 1925 D, 154 (1925)

⁷ *Re Mandan Electric Co*, P U R, 1925 D, 508 (1925)

⁸ *Re Omaha and Council Bluffs Street Railway Co*, P U R, 1925 D, 744 (1925)

⁹ *Customers v. Worcester Electric Light Co*, P U R, 1927 C, 705 (1927)

sion reduced a rate allowed by the United States District Court from 8 to 7 per cent.¹ Eight per cent was approved in an Arkansas² and a South Carolina³ case. In Los Angeles a rate of 6.5 per cent was approved with the expectation of increase in net revenue with "increased efficiency and economy and coordination of its system."⁴ In Michigan a 7 per cent rate was approved.⁵ In Indiana a rate of 6 per cent was considered sufficient by the commission although the federal court had objected to such a low rate.⁶ In Baltimore the United States Circuit Court pronounced 6 per cent or anything below 6 per cent as confiscatory.⁷ The New England Telephone and Telegraph Company was allowed a temporary return of 8 per cent in Massachusetts on the ground that its stock commanded a poor price in the market.⁸ The Rhode Island⁹ and New Hampshire commissions¹⁰ took like action. In West Virginia the Supreme Court of the state confirmed a rate of 7 per cent.¹¹ In this case the court made a distinction between the interest as the reward for the use of capital and profits as the compensation to the management for its responsibilities. In case of the gas plant $1\frac{1}{2}$ to 2 per cent was allowed for profits and 2 to $2\frac{1}{2}$ per cent on the electric plant.¹²

Actual Cost of Capital and Rate of Return.—The Wisconsin Railroad Commission early reached the conclusion that the return should be divided into two component parts, namely, interest and profits. It has become the custom of various commissions to figure the rate of return on the actual cost of the capital but only as a method of arriving at a rate of return on the "present value of the property," the formula required by the courts. An exemplary detailed table showing the amount of bonds and stock with interest and dividend requirements and the equivalent rate of return on the entire investment was worked out in the Queens Borough Gas case of New York.¹³ But this reasoning has been unacceptable to

¹ *Re New York Telephone Co.*, P U R., 1926 E, 1.

² *Fort Smith case*, 294 Fed 102.

³ *South Carolina case*, S F (2d) 77.

⁴ *Re Southern California Telephone Co.*, P U R., 1925 C, 627 (1924).

⁵ *Re Michigan State Telephone Co.*, P U R., 1925 A, 3C (1922).

⁶ *Indiana Bell Telephone Co. v. Public Service Commission*, 300 Fed 190 (1924).

⁷ *Chesapeake and Potomac Telephone Co. of Baltimore City v. Whitman*, 3 F (2d) 938 (1925).

⁸ *Re New England Telephone and Telegraphy Co.*, P U R., 1925 E, 739 (1925).

⁹ *Public Utilities Commission v. New England Telephone and Telegraph Co.*, P U R., 1926 C, 207 (1925).

¹⁰ *Re New England Telephone and Telegraph Co.*, P U R., 1926 E, 186 (1926).

¹¹ *Huntington v. Public Service Commission*, 101 W Va 378 (1926).

¹² *State Journal Printing Company v. Madison Gas and Electric Company*, 4 W R C R 501 (1910).

¹³ *Re Rates of Queens Borough Gas and Electric Co.*, 2 P S C 1st D (N Y) 544 (1911).

the courts particularly in the post-war period ¹ The Supreme Court of the United States faced this question squarely in the *Southwestern Bell Telephone* case in 1923 The court adhered to the principles laid down in *Smythe v Ames*, requiring a reasonable rate of return on the present value of the property Mr Justice Brandeis wrote a famous dissenting opinion in this case Among other things he said,

A rule which limits the guaranteed rate of return on utility investments to that which may prevail at the time of the rate hearing, may fall far short of the capital charge then resting upon the company.

In essence, there is no difference between the capital charge and operating expenses, depreciation, and taxes Each is a part of the current cost of supplying the service, and each should be met from current income

The adoption of the amount prudently invested as the rate base and the amount of the capital charge as the measure of the rate of return would give definiteness to these two factors involved in rate controversies which are now shifting and treacherous, and which render the proceedings peculiarly burdensome and largely futile ²

No matter what rate base is chosen, the return on the capital invested must be sufficient to maintain the credit of the corporations and to attract new capital to public-utility enterprises This requirement cannot be compromised, for utility enterprises under regulation depend not upon surplus earnings for expansion purposes but at all times depend upon the investing public While the decisions and opinions above cited show clearly that the courts work on the principle of competitive cost of capital in fixing a rate of return, they nevertheless fail to carry the principle to its logical conclusion The principle of competitive capital cost demands only that the return shall be sufficient to meet the conditions of the market at the time the securities are being floated. Contracts once made remain unchanged, and a return sufficient to meet the contract requirements will always be adequate As each new issue of securities is floated, care must be taken that the future earnings will be large enough to meet the new costs incurred.

The pressing need of regulation is conformity to the modern highly specialized capital market. Originally the capital market was simple and local in character A knot of friends possessing capital would associate themselves together, pooling their resources in a common undertaking and each assuming the same risk, exercising a voice in the management, and receiving the same reward The stockholders of the early corporation were to all intents and purposes partners But the capital market today is more refined in character. The leading types of issues of

¹ *Philadelphia City Passenger Railway Co v Public Service Commission*, 271 Pa. 39 (1921), *City of Huntington v Public Service Commission*, 89 W. Va. 703 (1921); *Minnesota Gas case*, 285 Fed. 818 (1923)

² *Southwestern Bell Telephone case*, 262 U. S. 276 (1923)

public-utility operating companies, outside railroads, are mortgage bonds, debenture bonds, preferred and common stocks. Mortgage bonds are adapted to those desiring to assume only the minimum amount of risk. These issues hold a position of priority of claim as to assets and earnings of the corporation. Their holders in return for this privilege are content with a comparatively low rate of return. Debenture bonds and preferred stocks are purchased by those who are in the habit of assuming business risks.

The common stockholder expects for the most part, in return for his acceptance of the weakest position of all security holders, a higher rate of return in regular dividends, with possibly some increase in value due to surplus earnings. He has the right to expect that in ordinary times the earnings will be sufficient to cover the requirements of operating expenses and senior capital charges with enough remaining to pay regular dividends on the common at a given rate. In return it is primarily he who accepts the risks of fluctuating business conditions, wars, calamities, wage demands, and even of regulation itself.

Thus properties as such do not compete with each other in the modern capital market as they once did. On the contrary, mortgage bonds of public utilities find themselves in competition with mortgage bonds of other enterprises, with farm and real-estate mortgages, and even with civil loans. The amount of assets in relation to the amount of mortgage bonds issued must conform to the accepted standards of safety. So also the margin of earnings over interest requirements for these issues must follow standards recognized in the banking field. If a 50 per cent margin for assets over the bond issue and 75 per cent of earnings over interest requirements are demanded, these standards must be recognized in financing under regulation. Similarly, accepted standards for debenture bonds and preferred stocks must not be ignored if public-utility enterprises are to get their portion of current capital funds.

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CHAPTER XX

ELECTRIC LIGHT AND POWER

The Realm of Electricity.—Light, heat, and power constitute an indispensable trio in the industrial and social life of today. These a host of men of scientific or commercial bent set themselves to achieve through the medium of electricity. They have had preeminent success in the field of light. For countless ages wax and tallow candles and torches shed their puny glow on the street and in the homes and public places. Then in the third quarter of the nineteenth century kerosene and gas in turn held brief sway only to be eclipsed by the magic rays of the electric light which today reigns supreme in the field of illumination.

Each stage of material progress of the human race is marked by the conquest of some new source of power. The story of conquest of electricity in the field of power is almost equally brilliant as in the field of light. From time out of mind man with his own sinews labored to carry the load of power necessary to eke out a tolerable existence. Then his intellectual superiority commanded the reindeer, the ox, the horse, to relieve him of a portion of his load. Later wind and water were utilized to the same end. It was indeed a landmark in the history of human progress when the steam engine came some century and a half ago to lift these burdens and initiate the material and social progress of the modern age. Commerce and industry, art, science, and literature, the social and political life of the people, all have been utterly transformed through this great invention. But the direct application of mechanical power to industry proved to be too expensive, inconvenient, and cumbersome. Then appeared the electric motor driven through transmission lines of great length and power which vastly reduced the costs per unit of energy needed and by its silent and inoffensive presence captured the field of direct power in the home and now bids fair to conquer the field of industrial power. With long-distance transmission of power will doubtless come a decentralization of industry and revival of the smaller cities and towns and new interest in rural life. Utilization of electric power dispenses with all belting and shafting, motors are constructed for any load desirable and there is instant availability of power for all occasions.

In the realm of heat, electricity has made considerable progress also but is only of secondary importance, heat is still to a large extent provided by direct combustion of fuel and by radiation. Nevertheless, the heat generated by electricity through the resistance coil has succeeded all other forms where intensity is desired.

Altogether the record of progress in electricity has probably never been equaled in the annals of industry. Nevertheless, the field for future progress is still one of the most promising. The electrification of industrial power is still far from complete, while rural and railroad electrification have scarcely been touched. In the home, too, in spite of great advances recently made, the use of power is yet in its early stages of development. Opportunities for the application of electricity in foreign countries offer a vast field for the resources of American men and capital. The utilization of electric energy is still in its youth and the industry will continue to appeal to the best men of technical and commercial talent.

Technical Development—The electric light and power industry of today rests upon a series of brilliant inventions and discoveries, which for the most part have been achievements of the nineteenth and twentieth centuries. The story of these accomplishments forms one of the most fascinating in the entire galaxy of technical science.

Basically considered, the electrical industry consists of the conversion of mechanical energy into electrical energy, the transmission of this energy to points of utilization, and its transformation into light or its reconversion into mechanical energy divisible into any amounts desired. The technical links in this chain are the generator, or dynamo, the transmission and distribution lines, the lamp, and the motor. The invention and perfection of these units, to the point of economy where they become available for commercial use, constitute the main points in the development of the technical side of the industry.

Electricity is merely a name given to certain manifestations of force and energy. Static electricity produced by friction and the shock-giving properties of the torpedo fish were both known to ancient peoples. Thales of Miletus had observed already in 600 B. C. the power of attraction of amber and jet when rubbed. William Gilbert, physician to Queen Elizabeth, named the property *vis electrica*, after the Greek word for amber. In 1729 Stephen Gray discovered that the property could be transferred from one material to another and transmitted from one part of the body to another. Conductivity of certain materials was thus early known. In 1733 du Fay discovered two kinds of electricity and found that unlike kinds attract each other but like kinds repel each other. He named them "vitreous" (positive) and "resinous" (negative) electricity. The first he obtained by rubbing glass with silk and the second by rubbing resin with wool. Already in 1700 frictional machines had been invented for giving strong charges. About 1780 Galvani discovered dynamic or current electricity while experimenting with frog legs but apparently did not comprehend his discovery.

The Electric Light.—In experimenting with the Leyden jar, invented in 1745 by Musschenbroek and Bishop Von Kleist, and with the voltaic pile constructed in 1796 by Alessandra Volta, it was discovered that a

break in the circuit produced a bright light. In 1809 Sir Humphry Davy showed the brilliant light of the voltaic arc produced by passing the current through two sticks of carbon. This early arc light, however, was not commercially practical. The production of carbon sticks by the modern process of mixing molasses with ground carbon was accomplished by Bunsen in 1840. But the problem of generating a current sufficiently strong to produce light in quantity on an economical basis had not yet been solved. Early efforts in this direction were made by Oersted, who in 1820 discovered that "a wire carrying a current exerts a force on a magnet or produces a magnetic field." Ampere discovered the mutual attraction of parallel wires carrying currents in the same direction and the mutual repulsion when currents were passing in opposite directions. Thus electrodynamicism was discovered. Faraday in 1831 produced the first dynamo in the discovery of electromagnetic induction. While this involved the fundamental principle of modern generators, it was first made commercially practical some 40 years later through the improvements made by Siemens, Wheatstone, Gramme, and others.

By 1866 a dynamo had been built powerful enough to allow the installation of arc lights in a few lighthouses in France and England and in the yacht of Napoleon III. During the seventies the arc light made rapid progress in the illumination of streets, parks, and auditoriums, but it was unsuitable for residence and similar lighting. The problem now was to "divide the electric arc," the solution of which awaited the modern wizard of the industry, Thomas A. Edison, an inventor of the incandescent lamp.¹ Arc lights were strung in series and the current passed through all in the series simultaneously. A break in the current by failure of one of the lamps would throw the entire number out of service. In order to remedy this situation, the current had to be divided so as to make each light independent of every other one. The incandescent light was economical, using only a fraction of the current required by the arc light, it permitted the tapping of the main wires for each light, thus creating separate paths for the current. Great crowds visited the Menlo Park demonstration in 1879. Although the incandescent lamp created a scare in gas circles sufficient to cause a sudden drop of 12 points in the securities of the London Gas Company, general skepticism still prevailed. A committee appointed by the House of Commons in England in 1879 to investigate electric lighting turned a deaf ear to Edison's invention.

The filament gave the most trouble in the development of the electric light. Edison's light used a filament of carbonized cotton sewing thread.

¹ Experimental electric lights were known already in the middle seventies. Jablotchhoff exhibited his "electric candle" at the Paris Exposition in 1879, but when Edison went to work at Menlo Park his light was already far superior to the toy lamp of Paris. Edison sought a light of commercial importance and announced at the very time the toy lamp was on exhibition at Paris and that he could light all of lower New York with a 500-horsepower steam engine.

enclosed in a vacuum bulb and burned on the average for only 40 hours. The next year a bamboo filament was made to replace the cotton filament which in turn was soon replaced by a superior chemical filament made in the Edison laboratory in 1889. This served until the more recent tungsten metal filament was invented whose general superiority led to its substitution for all other makes. Edison's labors extended also to the development of a distributing system, a metering system, even voltage throughout the circuit, and many other aspects of electricity.

Electric Power.—Electric power had to wait upon the motor to transform the energy produced by the dynamo back into mechanical power. The principle of the motor is similar to that of the dynamo and was first demonstrated by Faraday in 1821 through his "electromagnetic rotations." Not until after 1870, however, when the dynamo was perfected did the electric motor make progress. Then in the eighteen eighties came the development of the high-voltage alternating current for incandescent lighting which made possible long-distance transmission of electrical energy. Garland and Gibbs transmitted a high-voltage current from Rome to Tivoli more than 20 miles and transformed it back to low voltage for lighting. George Westinghouse bought the patent for America and, after gathering together other patents connected with the incandescent lamp, started the Westinghouse Company. These inventions were followed by Stanley's transformer which through the induction of a secondary current resulted in vast saving in long-distance transmission. But after the invention of the induction motor by Nikola Tesla the alternating current displaced the direct current for power. These inventions opened the way for the hydro-electric plant located far from the seat of utilization of energy and prepared the way for the giant and superpower development of the present time.

With the development of the high-tension transmission line since 1912, generating units have greatly increased in size, the radius of transmission has lengthened, 24-hour service has been introduced, and economy has grown apace. The old plant with 500 kilowatt units has been replaced by units of 30,000 capacity, while units with 60,000 and 90,000 kilowatts are in service, with others as high as 200,000 kilowatts being installed. In 1920 transmission lines of 200 miles or more in length were in service, which makes possible steam and hydro interconnection. The highest voltage in operation in 1929 was 220,000, traversing altogether 1,442 miles of lines. Plants of 13,000, of 33,000, and of 66,000 voltage served over 43 per cent of the transmission lines. But there are definite economic limits to the distance that electric energy can be transmitted. At the present time the average distance traveled by a kilowatt-hour of electricity on its way to the consumer is only 22 miles.¹

Edison Stations.—Although the Edison Electric Illuminating Company of New York was chartered in 1880, the first central electric station, the Pearl Street station in New York, was not established until 1882 and was the work chiefly of Thomas A. Edison, who when the faith of the capitalists waned supplied the necessary funds to the extent of several hundred thousand dollars out of his own personal fortune with which to prove it a success. The light used in the first Edison station was not one-sixth as efficient as those of today and lasted only about one-fourth as long, while its cost was vastly greater. The New York station was a success from the start. It was opened September 4, 1882, for commercial service. It first had 59 customers which grew to 203 before the end of the year. In all they used 5,228 incandescent lamps.¹ It succeeded in running for 14 months without serious interruption to service.² Also in 1882 the first Edison hydro-electric station was placed in operation in Appleton, Wis., and two more Edison steam stations were constructed in Chicago. Within the next few years the Edison stations numbered in the twenties. All employed almost exclusively incandescent lamps for interior lighting, there being scarcely any arc lights on these circuits. While charges were on the monthly basis at the rate of 1 cent per lamp-hour, 14 cents per kilowatt-hour was a fair average cost to users.

The low-voltage Edison stations used a 220-volt direct current and could supply every need but could deliver current only a few thousand feet from the station. The arc light companies, established mostly in the seventies and found in almost every city, were high-voltage systems. The opportunity of adding indoor incandescent lighting to their service came with the invention of the high-voltage alternators. Finally in 1888 Nikola Tesla invented the polyphase apparatus, known as the commutatorless alternating-current motor, which made possible economical long-distance transmissions and the correlating of both types of current.

¹ Among the early patrons were the banking house of Drexel, Morgan & Company, the New York Stock Exchange, the Times Office, the Herald Office, and the Park Bank.

² The business-like beginning of the electric light industry in the United States stands in contrast to the promotion schemes in England. In 1880 the Anglo-American Brush Electric Corporation, Ltd., was formed and acquired the brush dynamo and arc light patents for £200,000. Two years later the "brush boom" developed. The company organized subsidiaries to deal in dynamos, arc lamps, and so forth. One of these, the Metropolitan Electric Light and Power Company, Ltd., was formed in 1882 with £1,000,000 capitalization, paying £175,000 to the parent company for the right to sell Brush dynamos and the right to use the Lane-Fox incandescent lamp in the Metropolitan district of London. This development was premature. There was too much competition and too many experimental devices on the market; but the fatal defect was the lack of demand for electricity. The boom soon collapsed. This was responsible in part at least for the passage of the Electric Lighting Act of 1882, which limited franchises in London to 21 (afterwards increased to 42) years, after which the property was to go to the city at "structural" value.—A. G. WHITE, *The Electrical Industry*, Chap. II.

The closing decade of the nineteenth century saw the unification of the arc light and Edison companies into single central electric stations capable of supplying all kinds of electrical service. The outstanding improvement at the beginning of the twentieth century was the steam turbine as the successor to the reciprocating engine in large generating stations. This revolutionized the size of central stations. Today units of 50,000 kilowatt or 67,000 horsepower constitute the minimum economical unit, while one is under construction designed ultimately for 1,000,000 kilowatts and 270,000 horsepower.

The Growth of the Electrical Industry.—The electrical industry furnishes a record of growth unequalled in any other important field of economic enterprise. Its progress dates from the invention of the incandescent lamp and the electric motor. Electric lighting first made its appearance among the well-to-do classes in the large cities, where it replaced gas lights. But on account of its expensiveness in the initial stages of development, it was the aristocrat in the lighting world. Time brought reduction in costs and with it the gas light was rapidly relegated to the poorer centers of the population and subsequently disappeared almost entirely except in certain New England communities. Moreover, the electric light has spread rapidly to all classes of the population, to the smaller cities and towns, and even to the rural districts, in spite of the fact that expenses of lighting in these outlying districts remain much higher than in the urban communities. By 1890 the electric light was thoroughly established in every city of any size in the United States. The climax of public interest was reached at the Chicago World's Fair in 1893. In 1890 the United States and Canada signed agreements in regard to limited diversion of water at Niagara Falls, which agreements have remained in force down to the present time. This was followed by the installation in New York of 10 alternating-current generators of 5,000 horsepower, each capable of delivering 12,500 volts of electricity. The application of the turbine principle in both steam and hydro-electric plants marked the completion of major steps in the generation of electricity.¹

The growth of the electric light and power industry within recent years is reflected in the growth of the number of customers. They grew from less than 2,000,000 in 1907 to nearly 25,000,000 in 1930 (20,400,000 domestic, 3,664,000 commercial, and 600,000 power), when something like 85,000,000 people, or 70 per cent of the entire population, lived in electric-lighted homes. The output of the industry rose from 2,507,000 kilowatt-hours in 1902 to 91,421,000,000 in 1929. Total horsepower capacity installed has grown from 2,195,000 in 1900 to 8,497,000 in 1910, to 20,026,-

¹ It is claimed that Hero of Alexandria invented the turbine as early as 120 B. C. One of the first practical steam turbines was used by a farmer in New York in 1835. The turbine was later connected directly with the generator to form the "turbo-generator," thus doing away with shafting and belting.

000 in 1920, and to 47,000,000 in 1931. The percentage of primary power in the United States (exclusive of locomotives, automobiles, and so forth) installed in utility plants has steadily grown from 28.6 per cent in 1910 to 44.3 per cent in 1920, and to 63.8 per cent in 1930. Capital invested amounted to only about \$500,000,000 in 1902 but stood at \$11,800,000,000 at the beginning of 1931, making this industry rank third in the United States, gross revenues increased from less than \$100,000,000 in 1902 to \$2,151,000,000 in 1930. These indexes of growth form a convex curve which appears to be following the course of the Gompertz curve, which is found applicable to the development of numerous industries.

Rapidly as the sales of energy for lighting purposes have grown, energy for power has grown much faster. Electric motors in manufacturing, operating on purchased power, increased from 3,884,000 in 1914 to 19,144,000,000 in 1927.¹

In 1927 over 75 per cent of all primary power in the factories was supplied by electric motors, the increase having been especially rapid since 1920. Industry showing more than 90 per cent of total prime movers in 1927 were rubber products, machinery, and transportation equipment. Only chemicals and allied products, paper and printing, forest products, iron and steel, and food products showed less than 75 per cent electrified.² In 1902 only a small amount of power was supplied to industrial power machinery, while in 1928 over 46,000,000,000 kilowatt-hours were thus utilized, accounting for 47.5 per cent of the total industrial power in the United States. The per capita consumption of electricity in the United States has increased from about 30 kilowatt-hours in 1902 to about 73 kilowatt-hours in 1930.

Hydro-electric Power.—The development of water power started very early in connection with textile manufacturing in New England. But reliable statistical information goes back only as far as 1869, antedating the entire electrical industry as we know it today. In that year 1,150,000 horsepower represented the installed capacity. This grew gradually until 1912 when it stood at 4,770,000 horsepower. Since then, the growth has been more rapid and the total capacity in 1931 was 14,885,000 horsepower, or 20 per cent of all primary power. The first hydro-electric plant, the Appleton plant established in 1882, was very small, capable of producing only about 1 horsepower, and used the direct current. The development of hydro-electric power depended upon the perfection of the alternating current and its transmission. In 1889 an alternating-current transmission line was built on the Willamette Falls, Oregon City, Ore., which successfully transmitted energy from two 300-horsepower generators to Portland, a distance of 13 miles. In 1893 a three-phase alternating-current plant was installed at Redlands, Calif.

¹ *United States Census of Manufactures*

² *Ibid*

This plant used two Pelton water wheels and two generators of 333 horsepower, each developing a 2,400-volt current which was transmitted $7\frac{1}{2}$ miles to Redlands for lighting and industrial power. Development of hydro-electric energy has proceeded uninterruptedly since the nineties.

The world's electrical capacity at the end of 1928 has been put at 42,857,000 horsepower. Of this, 30,807,000 was steam and 12,050,000 hydro-electric plants. In 1930, of the 95,695,000 kilowatt-hours generated in the United States, 65.7 per cent was generated by fuel plants and 34.3 per cent by hydro-electric plants. The percentage varies from year to year according to the availability of water supply. In 1928 water power supplied 39.5 per cent of all energy. Within the past decade steam power has increased more rapidly than water power. Of the total hydro-electric power developed, about 28 per cent is found in the Pacific states, 6 per cent in the Mountain states, and the rest mainly in the Atlantic states. Leading opinion, however, seems to indicate that future development will be greatly restricted.

The development of increasingly efficient steam-driven electric power generating units and the decreasing number of suitable water sites, together with the fact that the efficiency of hydro-driven power generators has about reached its maximum, indicates that the bulk of future expansion in central-station construction will be comprised of steam plants.¹

Economics of Hydro-electric Development—Aside from technical matters, the fundamental reason for development of hydro-electric energy can be found in the availability of water sites in the past near to the market for the energy. In a general way, water-power development is subject to the law of diminishing returns. As long as sites are available which are within the reach of economical transmission, development will proceed. This is inherently a matter of costs in hydro-electric development influenced only to a minor degree by the cost of coal in steam plants. In the first place, it is basic to electric development that 70 to 90 per cent of the cost of energy to the consumer is incurred after the current has left the generating plant, whether steam or hydro-electric. This greatly reduces the possibility of economy in manufacture of current. Hydro-electric development involves extensive transmission lines, whereas the steam plant is free to locate close to the market, provided only sufficient water is available for steam. Extensive transmission lines and distributive systems are costly from the point of view of both initial capital investment and increased cost of line control and maintenance. Furthermore, long-distance transmission frequently loses as much as 15 per cent of the current. It is authoritatively stated that the cost of installing a 10,000-horsepower hydro-electric station including the transmission lines is from two to five times the amount for a similar steam plant. Interest

¹ *Statistical Supplement to the Electric Light and Power Industry of the United States*, 1931, p. 24.

and taxes will be proportionately higher. The average cost including transmission today of the hydro-electric plant is from \$200 to \$500 per horsepower. On the other hand, the hydro-electric plant utilizes 90 per cent of the energy of falling water, while the steam plant recovers only about 25 per cent of the coal energy, although steady improvements are being made in the latter.

Operating costs have more flexibility in steam than in hydro-electric plants, while fixed charges remain constant regardless of the amount of energy produced. Hydro-electrics, moreover, have a developmental expense and high overhead or fixed charges in proportion to the current sold as long as the market has not taken all of the energy which the plant can produce. Financing during the developmental stage is very difficult in hydro-electric undertakings. The hydro-electric plant has to contend also with uncertainties in the fluctuation of water from year to year and from season to season. Factors operating in favor of fuel-burning plants at the present time are (1) improvements and reduction in fixed and operating costs, (2) dearth of good water-power sites near the load centers, and (3) political and legislative interference. The entire matter of costs is summed up by saying that, as the industry is operated today, the production of a kilowatt-hour of electricity is less for the steam plant than for all but the most economical of the prospective hydro-electric stations.¹

The Function of the Hydro-electric Plant—But much of the discussion of the relative costs between the two forms of producing electric energy is beside the point. The recent development of hydro-electric plants is as a part of an interconnected system using both types of plants. The two forms of producing energy supplement each other. Unit saving may be made by interconnected systems in two respects, the one having to do with seasonal availability of water and the other with the daily peak load of service.

It is seldom feasible to provide water storage capacity in streams except in mountainous regions, so that the average plant is dependent upon the minimum flow of water of the river. Formerly when the plant was operated independently, only the minimum capacity of the stream could be used, since the current had to be furnished at all times. But in the interconnected systems the maximum generating capacity can be installed and used to the full extent of its capability in maximum seasons, while the steam plant can supplement the production of current in the minimum season. For the utilization of the maximum capacity of streams, only a comparatively small expense is required to add additional generating capacity, a form of the law of increasing returns is observed to operate, thus saving the operating costs of the steam plant during much of the year. So great saving in unit costs of water power can be made

¹ See *Electric Light and Power Industry in the United States*

in this way that it more than offsets the overhead costs of the steam plant during its idle period and for the entire year

The daily peak load applies most clearly where storage capacity can be provided. Here water power is used. Operating expenses in water power are low and the efficiency of operating does not depend upon the load factor. This gives a high degree of flexibility of water-power units of energy. On the other hand, the efficiency of the steam plant is largely dependent upon the load factor. In the interconnected systems the load factor is frequently as high as 60 to 70 per cent. The utilization of the hydro-electric thus furnishes the base load during the high-water season and the peak load during the low-water season. In the West and in mountainous districts in general where storage is easily supplied, water power is likely to predominate with steam as auxiliary, in the East where only the stream flow can be used, water power is likely to emerge as auxiliary to steam.

Future of Water Power—The United States easily leads the other nations of the world in water-power resources, as well as in the amount of capacity already developed. The Federal Water Power Commission places the amount available 50 per cent of the time at 59,000,000 horsepower, of which 38,000,000 horsepower is available 90 per cent of the time. Yet if all this were utilized it would not be sufficient to supply the present installed capacity, which was estimated at 66,000,000 horsepower in 1929.

Moreover the distribution of water power is quite as important as its amount. In the 13 northeastern states of the United States (including the District of Columbia) the total water-power resources are less than the present developed demand exclusive of railroad electrification. This area contains 40 per cent of the population of the country and uses 70 per cent of the power capacity. On the other hand, 72 per cent of the water-power resources lies west of the Mississippi River. About 21 per cent of the total water power of the country available 50 per cent of the time is already utilized. The Pacific states have utilized about one-fourth of the power available. Of the undeveloped water power of the country, 75 per cent lies in the Pacific mountain, and South Atlantic states with only about 22 per cent of the population of the country. There are legal restrictions upon the future development of water power in Maine, on the Niagara, and on the St. Lawrence. Of the undeveloped water power, a large part is thus unavailable because of the unfavorable location. Steam power will in all probability continue to hold the preeminent position which it has always held, while water power will serve in a supplementary way.

Outlook for the Light and Power Industry.—The outlook for the future of electric light and power as a whole is exceedingly bright. If three stages in the progress of an industry are recognized, namely, experimental,

developmental, and maturity, the electric industry seems beyond doubt to have passed the experimental and now is in the midst of the developmental stage

While the advance in the use of electricity for light has gone far toward saturation, the utilization of this form of energy for industrial and domestic power is still in an early stage. Electricity now bears 70 per cent of the industrial power load, only 50 per cent of which is generated by central stations. This is the highest degree of electrification in the world. Germany comes next with 66 per cent, then England with 48 per cent. Outside a few appliances such as the electric iron, vacuum cleaner, and toaster, the field of domestic use is undoubtedly scantily supplied. Such figures as there are show that the use of electricity for power and light reached about a parity in 1910. From 1912 to 1928 the use for lighting has multiplied more than six times but the amount utilized for industrial power has increased more than fourteen fold. The advance in the use of the electric iron, vacuum cleaners, refrigerators, socket radios, toasters, and the like has been very rapid within recent years. For instance, electric refrigeration for domestic use started only in 1921 when 6,000 units were installed, 1929 saw over half a million installations, while 1930 and 1931 each showed over a million, over 25 per cent of which were for commercial purposes and the balance for household use. The number of homes with electric refrigeration is now in the neighborhood of 4,000,000.

Rural Electrification.—The problem of rural electrification was first seriously attacked when in 1923 the National Electric Light Association and the American Farm Bureau Federation organized a committee to investigate the problem. Many associations joined this movement, among them are the American Society of Agricultural Engineers, Farm Equipment Manufacturers, National Grange, National Electrical Manufacturers Association, the United States Departments of Agriculture, Commerce, and Interior, and representative women's organizations. In the 7 years that mark the activities of this group, the number of farms electrified has increased from 166,000 to 648,000.¹ Over a hundred new and practical uses have been found for electricity on the farm. The number of farms in the United States has been officially placed at 6,371,640, at the present time less than one-tenth are electrified. In California over 81,250 farms, or 60 per cent of the total, are electrified. Already in 1927 the Rural Electric Service Committee of the National Electric Light Association concluded that "during the year electrification of the farm emerged from the experimental stages."²

It may be said that the technical problem of rural electrification has yielded to a solution. Scarcely a city of 1,000 population in the United

¹ *Statistical Supplement to Electric Light and Power Industry*, 1931.

² *Report*, 1927.

States today is without electric service, the extension of service to rural districts cannot be far off. The consolidation of electric companies into larger and more effective units, together with the interconnected systems and development of giant power, has completed the technical equipment necessary for the generation of energy for the farmers of the country. Consequently the problem today is financial rather than technical. Even in the city where the number of customers ranges from, say, 100 upwards to each mile of line, the distribution system is responsible for the major portion of the investment in steam systems. It has been estimated that the average number of farms per mile in the country is about three, so that the cost of the distribution system is much greater, perhaps five to ten times as great. Rural lines with transformers and protective equipment cost from \$1,200 to \$1,600 per mile, depending upon topography and other conditions. The best estimate places the cost of distribution system for Middle Western farmers at nine-tenths to nineteen-twentieths of the cost of delivering service to the farmers.¹

Various methods of financing have been tried in the recent past. In some instances farmers themselves have constructed their own systems but these are poor, require heavy repairs, and are soon in a generally dilapidated condition. Government subsidy offers another possibility but this method in the end must prove unsatisfactory and an injury to the cause. It is now generally recognized that the only sound method is to have the companies themselves construct the lines, in order to insure permanence and low repair and maintenance costs. This is all the more imperative since the farmers must still bear the expense of installation of electric service and the purchase of equipment which are in themselves financial problems.

The Farm Load.—Formerly the average farm load did not exceed 300 kilowatt-hours per year. It is estimated that the load must be about 1,200 kilowatt-hours in order to make it feasible for the company to establish a profitable rate. But in every state of the union many farms can be found already using as high as 3,000 kilowatt-hours per year, with a smaller number using 3,000 to 5,000 or 10,000 and more kilowatt-hours per year. The chief uses thus far are in the dairy and poultry industries, for water pumping for stock and household use, for lighting of buildings and homes, for refrigeration, cooking, fire protection, silo filling, grinding of grain, and a host of other uses. Extensive use is made of electricity where irrigation is undertaken. In order to succeed, electrification must be based upon economy to the farmer over other forms of energy. That constitutes the basic problem and introduces the question of rates.

Farm Rates.—It is now generally recognized that rural rates are a distinct problem the solution of which depends upon volume use. Two types of rates are becoming standardized at the present time. The

¹ Estimate of Prof. E. A. Stewart, University of Minnesota.

first consists of a monthly service charge which is levied on the principle of charging an amount that will represent the ready-to-serve cost, or the interest, taxes, and fixed charges due to the installation of the distributive system. To this is added a low energy charge usually with two steps. The second type of rate schedule starts with a guaranteed minimum annual revenue with various step energy rates.

The development of the load is the supreme problem of farm electrification. The recognition of this has influenced many companies to hold their charges below the cost of delivering energy, preferring to look to the future for their recompense rather than the present. Rural electrification, therefore, at the present time offers little or nothing in the way of profit to the companies. Rather it has become necessary to assess a part of the cost of rural energy upon urban customers.

Electrification of Railroads.—The possibilities of railroad electrification make strong appeal to the imagination on account of the immensity of the field and the spectacular character of some of the projects completed or under way. Nevertheless, it seems to be the consensus of opinion among those who have studied the situation that general electrification of railroads is yet far from being practical or economical.

Electrification began with the Baltimore and Ohio in 1895 in the tunnel at Baltimore for the purpose of eliminating smoke. From that time down to 1927 there were more than 80 instances of railroad electrification in the entire world. In every case "the compelling influence arose from the necessity of relieving some local or even general operating condition that could best be met by changing the motive power from steam to electricity."¹ The local conditions referred to relate to tunnels in mountainous grades, congestion in urban districts, and to a lesser extent terminal facilities and suburban traffic. The controlling reasons for electrification have been to increase capacity of lines, to improve the service, and to promote general economy. Nineteen railroads in the United States have electrified a portion of their track. Altogether the total mileage electrified is over 1,800 and trackage over 4,000 miles, but this represents less than 1 per cent of the total mileage for the United States. Noteworthy among these projects is the extensive program of the Illinois Central in the electrification of its Chicago and suburban service completed in 1926, to be followed by electrification of the terminal freight and passenger service. More spectacular are the 134 miles of route of the Virginian Railway through the mountainous district west of Roanoke, the 658 miles of route of the Chicago, Milwaukee, St. Paul and Pacific through the Washington mountains to Seattle, and the Great Northern Cascade tunnel. The Illinois Central electrification has thus far not proved directly profitable but will be of great value in the future through the

¹ Committee on Electrification of Steam Railroads, National Electric Light Association, 1927.

elimination of smoke and the utilization of air rights over the company's lands located adjacent to the Loop district. The Virginian electrification has proved very profitable on account of the constant speed and increased average of freight and passenger trains, the increased capacity of the line avoiding costly second trackage in moving almost twice the number of trains, resulting in general economy in operation. Doubtless the other mountain projects will show similar economy over the old steam motive power.

General electrification must await a greater density of traffic than that possessed by all but a very few lines in the United States. The increased efficiency of the steam locomotive of recent years and the greater use of oil as fuel have also done their part to postpone the general program of electrification. Nevertheless, the density of traffic on the Pennsylvania line between New York and Philadelphia now seems to warrant the Pennsylvania Railroad's undertaking electrification of the entire section.

New Uses for Electricity.—Besides these major developments, others of great promise are just emerging. The lighting of the main highways of the country, the airways, and the airports, and the field of interior air-conditioning embracing house-heating and cooling, promise a large potential load in the future.

Interconnection.—Interconnection is a term referring to the physical tying together of different transmission lines fed by different generating stations. The first examples of interconnection were made some 15 or more years ago when small and scattered plants were tied together into a single group of stations. By this means the small communities benefited in the improved character of the service rendered and at a cost low enough to approach rates in larger centers. As turbines and plants grew in size and the transformer and polyphase induction motor were perfected, it became feasible for the group of united plants to reach out to take in other groups similarly built up in order to collect a load sufficiently large to produce electricity economically. Interconnection is well illustrated by the Connecticut Valley Power Exchange. Here four independent exchanges exchange current with the object of utilizing their

... combined generating capacity so as to produce at a minimum cost the quantity of energy necessary to meet the ends of the participating exchanges. The central object is the most efficient use of water power plant owned and operated by the different companies, which are supplemented, of course, by certain large and efficient steam plants and other less modern and less efficient plants as well. To this end the exchange functions as a reservoir with which energy flows from the different exchanges and is dispatched and distributed to a large extent according to orders of the manager of the exchange, or his assistant units.¹

¹ Senate Document 238, p. 54, Seventy-first Congress, Third Session, 1931.

Perhaps the outstanding example of interconnection is the system of the South Atlantic states extending from Muscle Shoals through Alabama, Georgia, and the Carolinas. A saving of 2 per cent over independent operation of a number of steam and hydro-electric plants may be considered typical. The most recent type of interconnection is that which links together independent companies located in territories sufficiently close to each other to avoid the loss due to distant transmission. The gains from this sort of arrangement are (1) staggering of construction programs by independent companies so that no companies are compelled to build far ahead of the load that might reasonably be expected, (2) saving of fuel by utilizing during certain periods the more efficient plants, (3) great reduction in the reserve plant capacity necessary to each company acting independently in order to insure the continuity of service, and (4) mutual aid in times of emergency. The utilization of hydro-electric plants in this way where the cost of operation is small may be accomplished over several hundred miles distance with economy. Interconnection of independent companies, especially if they are small and if the hydro-electric plant is in reach, thus offers large opportunity for economical production of electricity.¹ Nevertheless, these interconnections have stretched all the way from Boston to Chicago and Saint Louis and on into Iowa, from Vancouver to Tia Juana, and from Duluth to Mobile. But interconnection, or superpower as it is sometimes called, is only as strong as the weakest link, which at the present time is almost always a system of 5,000- to 15,000-kilowatt capacity. Moreover, the economical transmission of electricity does not reach much farther than a hundred miles.

Operating Revenues—The operating revenues of electrical utilities present a picture of almost unbroken advance from year to year with the trend strongly upward and it is the most pronounced characteristic in the finances of electrical companies. It is due to the rapid increase in the use of electricity for industrial power, to the rapid increase in population of urban centers, to the still more rapid increase in the numbers of customers, and to the increase of the average household consumption of electricity. The average annual domestic bill increased from \$26.50 in 1922 to \$35.62 in 1930. The average increase in the annual consumption per customer has been mounting rapidly since 1926. In 1927 it advanced 3.7 per cent over 1926, and in 1930 the advance was 9.6 per cent over 1929. On the other hand, the price of electricity to the domestic consumer has decreased 8.9 cents per kilowatt-hour to 6.0 cents in 1930.

The revenues from light have throughout the history of electric utilities greatly exceeded those from power, the other main source of revenue, although the percentage of power revenues to the total steadily increases. In 1922 the revenues from light amounted to approximately

¹ See N. E. L. A. *Proceedings*, pp. 222-223, 1928.

61 per cent of all revenues but decreased to about 56 per cent in 1928. Revenues from power sales amounted to about 28 per cent in 1922 but increased to over 33 per cent in 1928. Although the sales of kilowatt-hours of electricity for power purposes in 1928 were over $2\frac{1}{2}$ times those for light, the low rates for power are responsible for the comparatively small percentage of total revenues. Revenues from sales to street railways and other utilities together amounted to about 10 per cent of the total. It should be noted also that the energy lost in transmission and used by the companies themselves is very large, amounting to almost 18 per cent of the total energy produced in 1928. A further classification of revenues yields the following results:

TABLE 39—REVENUES FROM ULTIMATE CONSUMERS
(In thousands)

Revenue	1928
Domestic service	\$ 668,500
Small light and power (retail)	593,300
Large light and power (wholesale)	585,150
Municipal street light	92,725
Railroads (chiefly small)	51,245
Municipal and miscellaneous	8,640
Total	\$1,999,560

Household appliances of all sorts are responsible for an ever-increasing proportion of the total domestic energy used. In 1929 domestic appliances accounted for 34 per cent of all domestic revenues.

In the individual plant, a high ratio of investment to gross earnings may often be accounted for by the nature of the load. Companies that show a high peak at certain hours of the day, or on certain days of the year, require large capacity to deliver the maximum amount at any interval of time. This capacity may be idle for much of the remainder of the time, although the load factor may be the same for each case. The smoothing down of the peaks and filling up of the valleys within recent times have greatly improved this situation and doubtless find reflection in the increasing ratio of gross to capital investment.

Operating Expenses—Direct operating expenses of electric light and power companies are officially classified into four main divisions: (1) fuel, (2) supplies, materials, and miscellaneous, (3) rent of offices, conduits, and so forth, and (4) salaries and wages. The percentage distribution of these items for significant years is shown in Table 41.

The increase in the percentage of total expenses for fuel from 1912 to 1922 is accounted for mainly by the increase in the price of coal, while the decrease since then is attributable almost entirely to increased efficiency in the use of coal, the price having dropped only slightly. In 1919, the first year in which data are available, it required 3.20 pounds of coal to

generate a kilowatt-hour of electricity. Every year since then shows a reduction, in 1930 it required only 1.62 pounds to generate a kilowatt-hour, a reduction of 49 per cent from 1919.

The increase in the percentage of salaries and wages is due partly to the increase in the average annual compensation from \$1,426 to \$1,566,

TABLE 40—HOUSEHOLD APPLIANCES

Appliances	Number in homes, Jan 1, 1931 (000 omitted)	Estimated use of current, kilowatt-hours per year		Annual cost of current (000 omitted)
		Per appliance	Total, 1929	
Flatirons	19,600	50	675,000	\$ 41,175
Vacuum cleaners	9,420	36	228,600	13,945
Washing machines	7,360	24	110,400	6,735
Fans	6,200	24	94,200	5,740
Toasters	8,190	50	155,000	9,455
Percolators	6,280	50	120,000	7,320
Radio sets	10,500	90	504,000	30,744
Space heaters	3,400	40	53,000	3,233
Water heaters	227	3,000	465,000	9,300
Ironing machines	650	125	61,500	3,752
Refrigerators	2,625	600	1,080,000	48,600
Ranges	1,020	2,000	1,710,000	42,750
Oil ranges	635	240	123,600	5,562
Total			5,380,300	\$228,311

From Statistical Supplement, *Electric Light and Power Industry in the United States*, N E L A

but mainly to the reduction in relative cost of fuel. Electrical generation utilizes coal, oil, and gas for fuel. While the use of oil from year to year is dependent somewhat on the price, the trend in the number of barrels consumed annually has been downward since 1924. The use of coal has continued to increase moderately in spite of greater efficiency in utilization. The phenomenal change has come in the use of gas within recent years. The use of this form of fuel has increased from 31,433,000 thousand cubic feet in 1923 to 120,213,000 thousand in 1930, a 40 per cent increase.

Taxes.—Taxes encroach more and more upon the revenues of electric light and power companies. State, local, and federal taxes increased from only \$13,117,000 in 1912 to \$187,500,000 in 1929. The proportion of operating revenues absorbed by taxes shows a steady increase from 3.4 per cent in 1902 to a maximum of 9.9 per cent in 1928. Since 1926 this percentage has increased only mildly. The encroachment on net revenues is more striking. In 1912 taxes absorbed only 6 per cent of net operating income, but they took 18 per cent in 1929.

Operating Ratio.—The operating ratio in electric industries is comparatively low but since 1912 has shown a tendency to increase. In that year, omitting taxes, interest, and depreciation, it was 52 per cent of operating revenue but was 56 per cent in 1922 and 47 per cent in 1927. The increase prior to 1922 was due to high prices for materials and supplies and increased wages. Since 1922, greater efficiency in operation has offset wage and salary increases as well as decreased cost to the consumer. The relatively low operating ratio is distinctly favorable to the electrical utilities, since variations in operating revenues will be less severely reflected in net income. Comparative immunity from fluctuations in net income is characteristic of electrical companies.

TABLE 41—OPERATING EXPENSES
(In per cent)

Division	1912	1922	1927
Fuel ..	26	33	23
Supplies, materials, and miscellaneous	23	18	18
Rent of offices, conduits, etc	3	4	4
Salaries and wages	48	45	55
Total	100	100	100

Effect of the Business Cycle.—The strong upward trend in the output of electrical energy from 43,555 million kilowatt-hours in 1920 to 97,350 million in 1929 has obscured the effect of the business cycle on the electrical industry. The severe depression of 1930–1932 showed a reduction of about 15 per cent from the peak in 1929 in the output of energy. This has been occasioned almost entirely by the use of electric power in industry. Plants located in the industrial districts of the country are more widely affected than those of more diversified regions. Owing to the low ebb at which the automobile industry found itself already in 1930, Michigan showed a decline of 9.3 per cent in its output of energy, although domestic consumption was greater in the latter year than in the former.

The industry has been marked by even greater financial stability. In spite of severe depressions, each year in the period 1882–1930 shows an increase in gross revenues over the preceding year. The relative stability and progress of public utilities (mainly electric operating companies), exclusive of telephone companies, are shown by the compilation of net income on page 393. A study of cyclical fluctuations in electric power production made by the Bureau of Business Research of the University of Illinois shows that there is a definite correlation between this industry and the business cycle¹. When attention is directed to individual companies, the differences are striking.

¹ See *Bulletin 16*, pp 24–35, for charts.

TABLE 42—NET INCOME OF CORPORATIONS

Year	102 industrial companies (net profits)	192 Class I railroads (net operating income)	27 public utilities, exclusive of telephone companies (net earnings)
1918	478	639	41
1919	427	516	43
1920	374	58	45
1921	172	616	46
1922	347	777	71
1923	504	984	84
1924	447	987	96
1925	606	1,137	110
1926	670	1,231	131
1927	618	1,085	150
	719 industrial companies	171 railroads	63 public utilities
1928	2,542	1,194	332
1929	3,006	1,275	361
1930	1,704	885	343
1931	667	531	297

Data, 1918-1927 from *Federal Reserve Bulletins*, 1928-1931 from *Monthly Review*, Federal Reserve Bank, New York, Apr 1, 1932

The basic principle here revealed is that an electric utility is the creature of its own environment. Its activity depends upon the specific conditions which affect its own operation. Large companies with diversified activities tend to conform more closely to general business conditions, while small companies depending on a single situation show cycles in production of kilowatt-hours peculiar to themselves and apparently unrelated to general business conditions. Furthermore, those utilities carrying a large industrial load will show cycles corresponding more closely to general industrial cycles in comparison with those located in rural communities whose main revenues are derived from the domestic sales of current. The cycle of individual companies shows a wider range than the composite cycle of all companies.¹

Statistics of the electric light and power industry furnished by the *Electrical World* show that the ratio of gross revenues to capital invested now stands at about 20 per cent, while the average before the war was about 15 per cent. This is undoubtedly a reflection in part of inflation, since much of the present plant and equipment was acquired on a lower price level while operating costs have risen rapidly. But perhaps the greatest influence came from the increased volume of electricity which

¹ *Ibid.*, pp 15-16

in terms of kilowatt-hours rose 542 per cent from 1912 to 1927, while capital invested increased only about 300 per cent. The increase in revenue was also due in some degree to increase in revenue per kilowatt-hour sold, which was 2.62 cents in 1912 and 2.64 cents in 1928. A rather pronounced seasonal movement in output and revenues of light and power companies is visible. The mid-summer season with its shorter nights and restricted industrial activity shows the low point in monthly revenues, while the mid-winter months with the longer nights produce the peak for the year.

Assets.—The assets of electric light and power companies, like those of all public utilities, are important especially in connection with regulation. They form the starting point for the determination of reasonable rates. No analysis can afford to omit this item from calculation, since it underlies all securities issued by the corporation. In the second place, assets are of fundamental importance in measuring the amount of securities allowed under regulation, for no authority will sanction an amount of total securities in excess of the capital invested. It is, nevertheless, true that in some plants overcapitalization perhaps exists as a legacy of the days when financing was still uncontrolled by commissions. The present prohibition upon the overissue of securities constitutes one of the strongest safeguards the investor has in all classes of public-utility operating companies and is in striking contrast to the overcapitalization existing in many industrial enterprises. Capital expenditures for all purposes during the period 1922–1929 amounted to \$6,100,000,000. This amount is 55.5 per cent of the total value of plant and equipment. This is greater than the capital invested in railroads in the same period. The plant and equipment of electric light and power companies account for over 80 per cent of their physical assets, typical cases falling between 85 and 90 per cent. Hydro-electric companies typically show fixed assets equal to 90 per cent of total assets. Large electrical generating systems involving hydro-electric plants will require about equal investment in generation and transmission, while the investment in distribution system will exceed either.

Corporate Organization.—The organization of electric light and power companies presents a bewildering maze of interrelated corporations whose separate functions are not always apparent to outsiders. At the bottom of the corporate pyramid is found the operating properties upon which is superimposed one additional organization after another until the pyramid appears to taper into nothing. While the operating properties themselves are of necessity mostly local in character or cover a limited area, the sphere of influence of the superimposed companies often is nationwide or even international in character.

The outstanding fact in this movement has been the unexampled trend toward concentration of management of the local utilities in the hands of

absentee officers, centralized corporation control, diffusion of capital ownership, and correlation of systems. The number of commercial systems increased until 1917 when 4,224 were in operation, in 1927 only 2,135 remained, a loss of 43 per cent.¹ Out of this movement has come greater efficiency in operation, reduced rates to consumer, and extension of service to remote localities where the cost of local plants has been prohibitive. On the other side of the picture, the controlling motive has been the pursuit of profit. The thin equities represented by the small layer of securities toward the top offer exceptional opportunity for profit in an industry whose upward trend is the most pronounced characteristic. On the basis of their corporate relationship or banking sponsorship, the important organizations in the United States are grouped into 10 different divisions by one writer.²

¹ Census Bureau, *Electrical Industries, 1927*

² See the clarifying article in *Barron's*, Feb. 2, 1931, by Harry T. Rohs. This writer groups the organizations as follows:

1. Electric Bond and Share Company and its affiliates, which include the American Power and Light Company, National Power and Light Company, Electric Power and Light Company, American Gas and Electric Company, and American and Foreign Power Company, Inc.

2. The group of properties having as bankers Bonbright and Company, J. P. Morgan and Company, Drexel and Company, National City Bank, and the Guaranty Trust Co. These companies include Commonwealth and Southern Corporation, Niagara Hudson Power Corporation, Consolidated Gas Company of New York, Public Service Corporation of New Jersey, United Gas Improvement Company, and Columbia Gas and Electric Corporation.

3. A group identified largely through Harris Forbes and Company with the Chase National Bank. This group includes United States Electric Power Corporation with its control of Standard Gas and Electric Company, Associated Gas and Electric Company, Utilities Power and Light Corporation, Cities Service Company, and the Public Utility Holding Corporation controlling Central Public Service Corporation. H. M. Byllesby and Company also is prominently identified with this group.

4. The Insull properties, important working positions which are controlled in the Insull manage through personal investments and holdings of the various Insull investing companies. These properties include Middlewest Utilities Company, Commonwealth Edison Company, Peoples Gas Light and Coke Company, and Public Service Company of Northern Illinois.

5. The North American Company, one of the largest independent working groups, with assets of around \$700,000,000. In addition to its wholly owned subsidiaries, it also has a substantial interest in Detroit Edison Company and in Pacific Gas and Electric Company. Its 32 per cent holdings in the latter were obtained in the spring of 1930 through the sale of North American's Western Power properties to Pacific Gas and Electric in exchange for 1,820,000 shares of the latter's common stock. It also shares with Middle West Utilities Company an 86 per cent interest in the North American Light and Power Company.

6. United Light and Power Company, dominated by Cyrus Eaton and his affiliates.

7. The Stone and Webster group. Stone and Webster, Inc., a holding company, controls Engineers Public Service Company, owns Sierra Pacific Electric, and has management or engineering arrangements with Tampa Electric, Eastern Utility Associates, and other properties.

The Holding Company—The main function of holding companies is to assist in financing weak subsidiaries, they sometimes render engineering and commercial service in addition. The activities of holding companies have been extended to the control of the strongest operating units in the industry. In such cases, instead of rendering assistance, they have become a reflection upon the credit of operating companies, as, for instance, in the case of the Middle West Utilities. The benefits of this kind of consolidation are limited and such an organization is more than likely to encounter hostile political opposition and public resentment. The sound consolidation will cover an area limited by the advantages of interconnection or financial assistance. Examples of soundly built units are found in the Pacific Gas and Electric Company and Southern California Edison Company, each occupying an extended compact district of its own. Some indication that this will be the future trend of consolidation is found already in the interchange of properties or contemplated mergers between groups with this principle as a guide. It is in line with the principle of giant power development.

Management Company.—The management company makes no effort to control the subsidiaries but through the ownership of a substantial amount of stock, generally of permanent investment interest, it serves the subsidiaries and receives fees for general supervisory, engineering and financing, and commercial services. The dominant trait of this type is likely to be its engineering and commercial talent. The best examples of this type are the Electric Bond and Share Company, Stone and Webster, and Standard Gas and Electric Company (operated by Byllesby Engineering and Management Corporation).

The Investment Company.—The investment company assumes no responsibility for supervising, engineering, or financial services. It exists as its name indicates purely for investment purposes or to bring about mergers (in which cases they are misnamed). They are likely to own

8 The Koppers Company. While primarily interested in the gas business and production of coke ovens, it has sizable interests through various investment affiliates in electric properties, outstanding among which is a large block of U. S. Electric Power Corporation which controls Standard Gas and Electric Company through the Standard Power and Light Company.

9 American Water Works and Electric Company, a company standing more or less alone. W. C. Langley and Company has long been identified with this organization's financing and is also closely related to the United Founders group, which controls U. S. Electric Power Corporation. Recently officials of American Water Works created a voting trust of 5 years' duration, to which was pledged a majority of the stock, thus safeguarding control by the present management.

10 American Commonwealth Power Corporation, headed by Frank T. Hulswit. This is the last and smallest of the 10 groups specified.

In addition, independent companies on the Pacific Coast operate the Pacific Gas and Electric Company, the Southern California Edison Company, and the Pacific Lighting Corporation.

preferred as well as common stock, and even bonds. Examples of this group are American Superpower Company, United Corporation, and Central States Electric Corporation. Many investment trusts of the pure type include in their portfolio large amounts of diversified public-utility securities along with securities of railroad, industrial, and other types of corporations. These are only incidentally interested in utilities.

Capitalization.—On the whole, the capitalization of operating electric light and power companies has followed conservative methods. Available statistics show that, at least in the past 15 years, capitalization has been well within property values. The relation of long-term debts to total assets has been kept within conservative limits also. In the case of fuel generating plants this relation was 40 per cent in 1920 and by 1926 had decreased to 37 per cent; hydro-electric plants, while also conservatively financed, show a tendency in the opposite direction, advancing from 38 per cent in 1920 to 43.6 per cent in 1926. The fuel-burning plants have shown a tendency to build up surplus and reserve accounts from which considerable new capital has been provided for expansion, leaving the equity for the stockholders almost 50 per cent of total assets. Hydro-electric companies having less need for new capital have built up less surplus and reserve accounts than the fuel plants.¹ This showing is a creditable performance, since stable earnings with a strong upward trend combined with large percentages of fixed to total assets furnish exceptionally strong basis for bond and stock issues.

Capitalization figures for central electric stations show that in the decade 1912-1922 important tendencies developed. It saw relatively large increases in preferred stock and funded debt and small increases in common stock. In 1922 capitalization was as follows.

Common stock	\$1,539,000,000
Preferred stock	522,000,000
Debenture bonds	14,000,000
Funded debt	2,248,000,000
Floating debt	141,000,000

Individual plants or systems show wide differences in capitalization. At the beginning of 1930, the North American system showed bonds equal to only about 38 per cent of property and investments (45 per cent of plant alone), which represents a gradual reduction from 65 per cent in 1920. On the other hand, preferred stock increased from 7 per cent in 1920 to 22 per cent in 1930. This is in keeping with the recent tendency to raise funds through the issue of preferred stock sold largely to customers. The American Water Works (73 per cent of gross income is derived from electricity) showed 47 per cent of plant and investment in

¹ See *Financial Plan of Electric Light and Power Companies*, Bureau of Business Research, University of Illinois, pp. 40-44.

bonds and 37 per cent in preferred stock Both of these companies have only a small amount of common stock

Mortgage Bonds.—Like many other kinds of corporate enterprises, the electric power and light industry copies its initial methods of finance from the real-estate mortgage and, like other kinds also, has retained certain standards born of that original type of financing. Such were the closed mortgages which were used universally at the beginning with 50 per cent margin in assets They also carried sinking funds roughly sufficient to offset depreciation of the property From the start closed mortgages were ill-adapted to an industry which required the investment of \$5 for each dollar of annual receipts and which was growing at an unexampled rate. Financing of this type was too short-sighted to supply the needs of the industry Future financing of extensions could only be done by means of issuing second-mortgage bonds on the old property, while the new addition stood as first security This kind of financing created a hybrid mortgage, part of which was first lien and part second or even third lien on units of property Such mortgages never rank the highest Today they are being refunded as rapidly as they fall due, but, needless to say, a large percentage of the outstanding mortgages in light and power securities is still of this description

First and Refunding Mortgage.—The solution of the financial problems of the operating utility was found in the open-end first and refunding mortgage This mortgage is a first lien upon the new units of construction and an inferior lien on the older units but with definite provisions for the refunding of the older bonds when they come due into a series of the first and refunding issue with identical security. This mortgage also provides for future issues with the same lien in new financing to the extent of 75 to 80 per cent of the value of the new construction which in turn comes under the mortgage These mortgages customarily require that the interest on the old mortgage and the future issues be earned from $1\frac{3}{4}$ to 2 or $2\frac{1}{2}$ times over As time passes, the older mortgages are refunded in this issue and the financial structure of the company is simplified and the security improves in value While these series are all of the same fundamental security, they usually are flexible enough to allow each new series to set its own conditions as to interest, maturity date, and redemption price The usual type of first and refunding mortgage bond has a callable feature so as to enable the company to take advantage of lower interest rates by means of issuing another series to redeem the outstanding ones The call price, of course, is commonly placed sufficiently above par to reward the investor for his inconvenience. The old sinking fund has given place to provisions for the maintenance of the property, replacements, and betterments free of mortgage liens, to the extent of, say, $12\frac{1}{2}$ per cent of gross earnings or from 4 to 6 per cent of the bonds outstanding Some recent mortgages substitute for these require-

ments a mandate that an independent engineer, after examination of the property, file with the mortgage trustee a statement that the property has been adequately maintained under penalty of cash deposits to make up the deficiency, if any. This type of bond is responsible for the larger portion of the capital recently invested in the industry. In a single year there were 90 mortgage bonds with par value of \$435,810,000 issued. The average yield was 4.69 per cent, the range from 4.40 to 6.50 per cent, over one-half of which sold between 4.40 and 5.00 per cent.

Debenture Bonds and Notes—Quite a few debenture bonds and notes are found in the light and power industry today, issued mostly by companies of strong credit. This enables them to build up a reserve financing power in time of high interest rates and credit stringency. The company keeps in its treasury a certain amount of mortgage bonds issued against new construction to be sold when occasion requires. It also strengthens the position of mortgage bonds, since it provides additional equity in property and earning power back of these bonds, provided, of course, that the issue is in moderate amount so as not to endanger the solvency of the company.

Preferred Stocks.—Preferred stocks have been used in electric corporations to provide for most of the remaining capital necessary after bonds. They are preferred almost invariably as to assets and earnings and carry a cumulative dividend of 6 or 7 per cent.

The amount of the preferred stock issued depends more upon earnings than assets, the usual stipulation being that dividends be earned at least twice over. Among the protective features is a similar provision to cover dividends on old and new stock before any new issues are permitted. There is further protection in the provision that, if dividends are not paid according to agreement, voting power is lodged partially or wholly with the preferred. Preferred stocks of these companies are frequently redeemable at the option of the company at a figure above par or issue price. They are also frequently convertible into common stock, while some carry participating features. Many preferred stocks are classified into first and second preferred or into Class A and Class B with different degrees of lien, the superior ones being designated prior preferred or prior lien preferred. These prior-lien stocks are generally placed behind issues already outstanding and unprotected. The statistical record of preferred stocks is unusually good. The *Electrical World* reported in 1931, in the midst of the severe depression, that out of 205 cases embracing practically all operating companies of \$1,500,000 gross annual revenue or more, and of every holding company with consolidated gross earnings of \$10,000,000 or more, current cash dividends were being paid on all but one issue. This issue was the only one with unpaid accumulated dividends. Twelve cases had shown deferred dividends somewhere in their record but had

been subsequently paid off. In all other cases, 192 in all, the preferred stocks had unbroken dividend records.

Common Stocks—The common stocks of electric light and power operating companies serving metropolitan territories generally rank high as investment stocks. Among the stronger companies may be mentioned the Consolidated Gas Company of New York, the Commonwealth Edison Company of Chicago, the Pacific Gas and Electric Company, and the Southern California Edison Company. Table 43 shows earnings per share and dividends from 1925 to 1931.

TABLE 43—EARNINGS PER SHARE AND DIVIDENDS OF CERTAIN ELECTRIC COMPANIES, 1925-1931

Company	1925	1926	1927	1928	1929	1930	1931
Commonwealth Edison							
Earnings per share	\$11 01	\$11 31	\$12 58	\$12 32	\$12 05	\$11 50	\$10 40
Dividends	8 00	8 00	8 00	8 00	8 00	8 00	8 00
Consolidated Gas							
Earnings per share	4 13 ¹	4 80 ¹	4 79 ¹	4 52	4 75	5 06	4 94
Dividends	4 00 ¹	4 00 ¹	4 00 ¹	4 00	4 00	4 00	4 00
Pacific Gas and Electric							
Earnings per share	2 39 ¹	2 61	2 86	3 17	3 52	2 87	2 79
Dividends	2 00 ¹	2 00	2 00	2 00	2 00	2 00	2 00
Southern California Edison							
Earnings per share	2 50	2 75	3 20	3 10	3 44	3 25	3 25
Dividends	2 00	2 00	2 00	2 00	2 00	2 00	2 00

¹ Adjusted to present basis

Nowhere in industry has such constancy of earnings appeared. Dividends have been kept well below earnings, even though the factor of safety is narrower than customary standards in other fields of finance. The dividend and earnings records of these companies inspire confidence in their properties and managements.

In contrast to this splendid record stand the common and preferred stocks of some of the leading holding companies in the electric field. Pyramiding here has proceeded so far that the depression of 1930-1932 eliminated earnings on the common stock entirely and entrenched on the preferred. The failure of the Middle West Utilities early in 1932, with its \$300,000,000 and more of investment, came as a climax to 2 years of declining position of these companies and the usual burden short-time obligations. The obligations could not be met on the poor earnings basis and receivership followed. The fate of this company stands as a warning to others against continuation of financial abuses.

Market for Electric Securities.—In the marketing of electric light and power securities, customer ownership has within recent years played an important part. This form of ownership of securities has advantages

to both the company and the security holder. It creates a body of stockholders who as customers of the company also have a financial interest in its welfare and hence tends to create a better mutual attitude between the company and the general public. By the sale of preferred stock in large amounts it places equities back of the senior securities, thereby giving a better balance to the capital structure and strengthening its credit. It has stabilized the market value of the securities in question and offers to the public a security of high quality. Between 1920 and 1928 customer ownership accounted for 16.2 per cent of all sales of securities to the public, the bulk still being sold through financial houses of one kind or another. Since the beginning of this method of financing in 1914 through 1928, 251 companies have used the plan with gratifying results, they disposed of 18,800,000 shares of stock in 1,884,000 different sales. Altogether, in 1925 alone, almost \$300,000,000 of issues were placed in this way. While preferred stock has been the chief type of security offered, bonds and common stocks also have been sold in this way. The stock thus sold has a broad distribution, averaging within recent years at something like 10 shares per customer. Among the purchasers all occupations are apparently represented. Among those most prominently represented are housewives (the largest single class), clerks, business men, minors, retired persons, managers, school teachers, salesmen, laborers, machinists, and agents.

The market for public-utility securities has recently been broadened in another direction. Life insurance companies have acquired mortgage bonds in large amounts. The 25 leading life companies representing 75 per cent of the total resources of life companies in the United States at the end of 1926 had a total of \$943,000,000 of public-utility bonds, most of which were undoubtedly those of electric light and power companies. This was 20.1 per cent of their total bond holdings. The extent of this new market is shown by the fact that these same companies in 1921 had only 7.7 per cent of their bond investments in public utilities. The funds of banks, universities, and endowments are increasingly being invested in the bonds of electric light and power companies.

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CHAPTER XXI

THE GAS INDUSTRY

Early Beginnings of the Gas Industry.—For several centuries gas has been produced in the laboratory by the chemist, and natural gas has been observed to emanate from various orifices in different parts of the world. John Baptist van Helmont of Brussels in experimenting with fuels in his laboratory in 1609 produced a strange "spirit" which he called gas. To him and the world in general this was a manifestation shrouded in deep mystery. Some time thereafter "strong breath" was observed to emanate from certain springs in England and ignited in the presence of a candle and "did burn like oyle." Dr. John Clayton of Yorkshire in his experiments from 1660 to 1670 distilled gas from coal in a closed vessel which served to dispel some of the superstition connected with gas. A century later, experimentation in distillation of gas from coal was revived. Minckelers at Louvain in 1784, Dundonald in England in 1785, and Lebon in Paris in 1786, all were actively engaged in experimentation.

It was not until William Murdoch set himself to the production of gas on a scale large enough for lighting purposes that the history of the gas industry really begins. He succeeded in 1797 in producing gas from coal in an iron retort and conducted it through a 70-foot tinned and copper tube to his house at Old Cumnock, Ayrshire. In 1798 he lighted the works of Boulton, Watt and Company, at Soho, Birmingham, England, manufacturers of steam engines, with gas. A large generator was built for their works and in 1802 a public display was given. In 1804 some cotton mills of Manchester were lighted and in 1808 he was awarded the Count Rumford Gold Medal of the Royal Society of London as a recognition of his achievements. Owing to the practical nature of his achievements, Murdoch earned the title of father of the gas industry. As early as 1799 Lebon in France also took out a patent for making gas by distilling coal and wood and 2 years later lighted his premises in Rue St. Dominic, Paris.

But it was not till the vision and activity of the promoter appeared that the commercial history of gas begins. The earliest, and apparently one of the most successful, promoters was Frederick Albert Winsor, a German, who in 1804 secured the first English patent for making gas. From that time onward, England seems to have been peculiarly the fosterer of the industry. Winsor sold enough shares in his company, The London and Westminster Gas Light and Coke Company, the world's

first gas company, to light Pall Mall in London in 1807. In 1812 the company was erected into a corporation and in 1813 the Westminster Bridge was lighted to the amazement of the populace. Winsor had visions of the gas industry which only today are coming into their own. He forecast the universal use of gas for lighting, but more remarkably for house heating also, by which great economies in construction were to be attained through the elimination of chimneys, stoves, and other equipment of the day. But in high and low circles he was the butt of ridicule. Sir Walter Scott branded him a madman and Napoleon pronounced his scheme to light London *une grande folie*. But after the demonstrations in London, street lighting gained over popular prejudices rather rapidly and began to spread to other cities. But the substitution of "inflammable gas" for lamps, lanterns, torches, candles, and the like required a stubborn fight against tradition and custom. By breaking down the barriers of custom and tradition, gas thus paved the way for introduction of other modern public utilities.

Gas Industry in the United States.—The first recorded demonstration of manufactured gas in this country was in 1796 by M. Ambrose and Company, Italian fireworkers, in Philadelphia. The most important early demonstration was made by David Melville who lighted his home and the street in front of his house in Pawtucket, R. I., with gas of his own manufacture in 1812. He procured a patent and applied the system to a factory in Pawtucket and was instrumental in inducing the government to light its Beaver Tail Light House with gas.¹ Watertown, Mass., is said to have lighted one of its cotton mills in 1813. But before 1816 the gas industry in the United States lacked a real promoter. This was supplied in the person of Rembrandt Peale who lighted his museum in Baltimore in that year and also procured a charter to manufacture gas and lay pipes in the streets of Baltimore and to contract with the city to furnish gas for street lighting. The execution of this scheme made Baltimore the cradle of the gas industry as it is known today in the United States. It was here too that the first American gas meters were manufactured. Gas companies were chartered for Boston in 1822, New York in 1823, Brooklyn in 1825, New Orleans in 1835, Philadelphia and Pittsburgh in 1836, Louisville in 1838, and Cincinnati in 1841. Thus between 1812 and the middle of the century many of the leading companies were established. But little progress was made prior to 1850, when only \$6,674,000 represented the total investment in the industry.

The chief use of gas in the first half century of the industry was for street lighting. It was gradually extended to public buildings, halls, shops, and industrial establishments and was even used by the wealthy in their homes. But the masses of the people stuck to sperm oil and wax and tallow candles on account of their cheapness when compared with

¹ Richmond claims that its principal street was lighted with gas already in 1803.

gas, whose rates ranged from \$6 to \$15 per thousand cubic feet. The first use of gas for domestic purposes was in the early thirties in England. In the United States gas lighting in the homes made little progress before 1865. It appears, however, that gas for cooking made progress earlier, for already in 1859 gas stoves for cooking, imported from England, began to be used extensively. Whatever progress the gas industry made in being introduced into the American home for lighting in the early period was retarded by the invention and rapid spread of the kerosene lamp after 1865. The pioneer period of the gas industry was attended with more than the usual misfortunes of a new industry in the experimental stage. It labored against public prejudice which found it a menace to health and life, an encouragement to thieves, drunkenness, and depravity, and interference with the divine plan of succession of day by night. The lack of capital and poor business methods resulted in a large number of failures which discouraged the entire industry. Among other things, the industry suffered from lack of volume. *Sperm oil*, wax and tallow candles, and the kerosene lamp were all infinitely cheaper than the gas light and occupied the same relative position to candle and kerosene light that electricity occupies today with reference to gas.

It was not until the decade following the Civil War that the introduction of gas into the homes of the people for lighting purposes made any great progress. Its field up to that time was preeminently for street lighting. But this use of gas received its first great blow, pronounced the greatest blow ever received by any American industry, with the invention of the electric arc light in 1878. The rapid spread of this invention aroused the gas men whose efforts were now directed to the introduction of gas in the home for lighting purposes, a field yet unoccupied by electricity. But no sooner was substantial progress being made here than its future was beclouded by the incandescent electric light whose superiority and practicability was first demonstrated by Edison, its inventor, in New York in 1882. The measure of advantage was not all with electricity, however, since it was much more expensive than gas. Gas was made less expensive by the introduction in the early eighties of the carbureted water-gas process of manufacture which replaced the coal-gas method.

But real progress in the gas industry awaited the spur of competition from electricity, natural gas, and oil, which brought technical improvements and reduced rates. The quality of the simple gas jet light was greatly improved in 1885 by the invention of the Welsbach mantle, which produced a white flame of high illuminating value, making gas the predominant light in the home. Thus extended the period of usefulness of gas for light in the home for many years. The Welsbach mantle was applied to street lighting a decade later and likewise served to prolong the use of gas by many municipalities far into the twentieth

century. But the battle became an unequal one, since the cost of electricity was reduced so rapidly after 1890 that the extinction of gas for street and home lighting was only a matter of time. By the time of the outbreak of the late European war, the gas men had given up the struggle against electricity for lighting purposes.

To make matters worse the gas industry was hampered by competition from within, which resulted in duplication of investment with its high costs and disastrous rate wars. This situation was the natural result of the mistaken theory of competition as a regulator of business, which public authorities subscribed to at the time. Attempts at consolidation were often frustrated by the courts, whose interest was to maintain the common-law tradition against monopolistic undertakings. Thus the gas industry struggled through an entire century, seeking to establish itself as the medium of lighting. It may be said to have succeeded in this with respect to street lighting, but even here its period of usefulness was not long and it was confronted with hard conditions through most of its career. On the other hand, the men in the industry showed a complaisance and lack of technical and business ability rarely equaled in the history of a great industry. Whatever success the gas industry had through the lighting phase of its history was due to lack of competition rather than to intuitive skill in conducting the industry. Competition of electricity for street lighting resulted in the gas industry assuming a more aggressive attitude and its sleeping energies were evident in the last quarter of the nineteenth century, when its efforts were directed toward establishing itself in the home and later toward reoccupying the street-lighting field. But the odds were too great, the final result being almost complete abandonment of the field in favor of electricity.

Technical Improvements.—The newly awakened interest in the gas industry was manifested in certain technical improvements in the last quarter of the nineteenth century. The reduction in cost of manufacture was accomplished largely after 1880 by the introduction of the Lowe process of manufacturing carbureted water gas (introduced first in 1873) to replace the older coal-gas process. In the manufacture of gas, coal gas is the oldest; this is made by heating to a red heat iron, clay, or brick retorts into which coal is placed, then the retorts are sealed so as to exclude the air. Pipes lead off from the retorts for the escape of gas. This results in the fusing and melting of the coal which then gives off the gas, leaving coke in the retorts. Tar and ammonia are condensed in the pipes receiving the gas and are utilized as by-products. The gas then has to go through a purification process before it is ready for use.

The manufacture of carbureted water gas is a more complex process. It is the invention of Lowe, who was head of the aeronautical corps during the Civil War, in his experimentation with gas for balloons. This kind of gas is made by placing coke or anthracite coal into a brick-lined gener-

ator, after heating to a glow, the air is shut off and steam is forced into the generator. This produces a chemical reaction with the fuel which then passes into a carburetor lined and honeycombed with bricks which have been heated by the gas from the generator. This produces carbon monoxide and hydrogen gases, which have low heat value but are enriched there by being mixed with gasified oil sprayed into the top of the carburetor. The oil is broken up into gases with a high heat value, after which it is mixed with the gases from the coke or coal. This process is continued in a third chamber, the superheater. Purification follows and the gas is then ready for use.

Gas By-products—In the manufacture of coal gas there are still three types of oven used. The older beehive oven is rapidly losing ground and may soon become extinct, while the coal-gas oven is responsible for a still smaller amount of gas made by this process. But the by-products coke oven has made rapid progress within recent years and now accounts for much the largest percentage of all gas made by the coal-gas process. The number of by-product coke ovens increased from about 25 in 1910 to something like 400 in 1928, while the percentage of coke made from these ovens rose within the same period from 20 to 85.

The significance of the development of the by-product coke oven is that gas companies using this process find themselves in a diversified industry. Introduction of the coke oven (mainly by-product ovens) in the gas business was made recently by New York, Brooklyn, Philadelphia, and many other cities. In 1928, 15.3 per cent of all by-product coke-oven gas was turned into city distributing gas systems, where it was used as the base-load of the city gas supply. Coke, ammonia, tar, and other by-products must now be sold. These by-products are used in the fertilizer business and in many other industries which utilize tar in the manufacture of their products. Substantial revenues are received by gas companies from by-products, such as coke, tar, ammonia, and light oils. It is estimated that in 1929 about 90 per cent of all coke made in the United States is by-product coke, whereas in 1913 it was only about 27.5 per cent.

Manufactured Gas.—The American Gas Association recognizes four different types of manufactured gas in its statistical compilations. The following statistics of production in millions of cubic feet show the situation:

Kind of gas	1928	1919	Kind of gas	1928	1919
Coal	85	65	Oil	30	26
Carbureted water	236	180	Coke oven	104	29

The proportion of manufactured gas from coke ovens grew from 10 per cent of the total in 1920 to 30 per cent in 1930. In the former year 86

per cent of all manufactured gas was produced in plants owned by gas companies but these plants produced only 57 per cent in 1930. The fuels used in the production of manufactured gas in thousand short tons were as follows:

Fuel	1928	1919	Fuel	1928	1919
Bituminous coal	9,900	8,500	Coke	9,000	3,000
Anthracite coal	500	4,000	Oil (million gallons)	5,700	6,200

1919 figures from United States Bureau of Mines, 1928, American Gas Association estimate

Manufactured gas is highly economical in its use of coal. It delivers 75 to 80 per cent of the thermal efficiency of fuel, while the electrical industry delivers only about 20 per cent.

Recent Progress.—In spite of the half century or more of struggle with competitive service of one kind or another, the gas industry has shown steady progress. The capital invested in the industry grew to \$5,000,000,000 in 1930. The manufactured gas industry accounted for about \$3,000,000,000 of this and natural gas for about \$2,000,000,000. The sales of companies engaged in the manufacture of gas (including some natural gas purchased) were 113,930,000 cubic feet in 1904 but increased to 271,593,000 in 1918 and to 490,000,000 in 1928. Customers increased from 8,484,000 in 1919 to 11,800,000 in 1928. The progress during the past 12 years is revealed in the following table:

TABLE 44—STATISTICS OF MANUFACTURED GAS INDUSTRY IN THE UNITED STATES

Year	Number customers, thousands	Gross revenue, millions	Total sales, million cubic feet	Domestic sales, million cubic feet	Industrial and commercial sales, million cubic feet
1919	8,484	\$285	300,000	218,310	70,380
1920	8,837	333	319,888	239,916	69,320
1921	9,200	379	326,951	245,902	70,671
1922	9,400	394	350,000	260,000	80,565
1923	9,800	423	384,722	278,560	92,425
1924	10,200	438	405,200	290,880	105,998
1925	10,600	452	421,400	300,500	113,000
1926	11,047	486	455,631	323,183	126,405
1927	11,450	501	471,000	329,000	136,400
1928	11,848	518	494,800	343,500	147,600
1929	12,139	533	524,100	358,900	163,100
1930	12,190	533	523,500	365,500	156,000

Compiled from records of the American Gas Association

Industrial and commercial sales have thus increased since 1919 by 109 per cent, while domestic sales show a gratifying increase of 55 per

cent In 1928 about 69 per cent of all sales were to domestic consumers, while industrial and commercial sales were about 30 per cent While these figures show that the gas industry is still primarily dependent upon domestic use, nevertheless, the relative gain of industrial and commercial over domestic use is evident In 1919 only about 23 per cent of sales was for industrial and commercial use The total consumption per customer for manufactured gas indicates a considerable increase in recent years In 1915 the average amount of gas sold per meter was 31,600 cubic feet and in 1925 it was 44,000 cubic feet.

Natural Gas in the United States.—Natural gas was first discovered in the United States at Fredonia, N Y, in 1821 and utilized there 3 years later in a mild way. But first in 1865 was a distributing company formed at the same place and in 1872 the first cast-iron pipe 2 inches in diameter was laid from Fredonia to Titusville, Penn, a distance of 5 miles Natural gas was discovered in a number of states during the eighties It was a perfect and inexpensive fuel and its use increased so rapidly that in 1888 about 750 billion cubic feet were consumed The next 25 years saw a decided shrinkage in the production and use of natural gas

Following the natural-gas boom of the eighties and the subsequent shrinkage in production during the following 25 years, oil men and prominent geologists freely predicted natural-gas exhaustion in the immediate future But since 1913 additional reserves have been uncovered Calculations as to exhaustion were set at naught through discovery of new oil fields and more recently by deeper wells The largest known field at the present time is the Amarillo, Tex, field It covers 1,000,000 acres of proven gas land with capacity of 300,000,000 cubic feet per day for 70 years The Monroe and Richland fields now deliver about 600,000,000 cubic feet per day and at this rate have known reserves sufficient for 16 years Deeper drilling indefinitely increases the reserves The reserves of the Appalachian district are calculated from long experience to last 25 years. At the present time Texas has advanced to first place in natural-gas production and Oklahoma has dropped to second place California and Louisiana are also large producers.

Utilization of Natural Gas—The large amount of known reserves of natural gas threaten the entire manufactured-gas industry In 1930 for the first time in 12 years the consumption of manufactured gas showed a slight decline which continued still further in 1931 At the same time, natural-gas consumption in 1930 increased 1.2 per cent over 1929 At the present time only natural gas is used in 6 states, in 10 others natural gas supplies over 90 per cent of total consumption, while it reaches commercially 36 states The largest market is for the replacement of manufactured gas in cities. Within the last 5 years natural gas has replaced manufactured gas in almost 100 cities and towns, ranging in size from 5,000 to cities such as Chicago. In January, 1931, natural

gas had 5,300,000 customers, serving the homes of 23,000,000 people. Consumption in 1930 was 1,940,000,000 cubic feet and the revenues \$415,000,000.

Until the present time natural gas has found its greatest utilization in industry. In 1930 only 19 per cent of total production was for domestic use. In industry, oil and gas field drilling and operations accounted for 37 per cent, production of carbon chiefly for the rubber and tire industry consumed 14 per cent, production of electric power 6 per cent, petroleum refining 5 per cent, and the balance, 19 per cent, for miscellaneous industrial purposes.¹ The most rapidly growing industrial use of natural gas, however, is by the public-utility companies as a fuel for generation of electricity. This has increased over 50 per cent in 2 years and some of the large companies, particularly on the Pacific Coast, have gone from oil to gas fuel. At the present time extensive natural-gas pipe lines sponsored by the electrical industry will be completed and further enhance the use of natural gas for this purpose.

An important use of natural gas is as an enriching agent for manufactured gas. In 1929 already 117,800,000,000 cubic feet were purchased for this purpose and represented one-fifth of all gas distributed by manufactured-gas companies. It is mixed with coke-oven gas which is sold as a by-product chiefly of the steel and iron and chemical industries. This produces a mixture of heat energy somewhere between the limits of manufactured gas (500 B t u) and natural gas (1,000 B t u). Natural gas is playing a leading role in the industrial development of the South. The industry is subject to no price regulation where the distribution or sale takes place. It is claimed that 81 per cent, the estimated amount used in industry, competed with other fuels and hence the industry is not one especially calling for regulation. The efforts of the industry are exerted against state or federal regulation.

The rapid increase in industrial consumption of natural gas comes as a recognition of the advantages of this form of fuel over others. It eliminates extensive use of machinery for the handling of fuels and the removal of ashes, while it also eliminates the working capital habitually tied up in other fuels. The additional advantages of cleanliness and instant availability at maximum heat are also of determining importance. In 1929 the average cost in New York was 8.2 cents per thousand cubic feet at the wells, while consumers paid on the average 21.6 cents per thousand cubic feet, depending upon the distance from the source of supply. In the Middle West average prices to consumers range from 44 to 50 cents, or more, per thousand cubic feet.

Development of Natural Gas.—While the discovery of new and vast reserves of natural gas are at the bottom of the renewed interest in natural

¹ See C. E. PAIGE, *Gas Industry in America*, *American Gas Association Monthly*, July, 1931.

gas, the invention of stronger pipe for transmission and better line construction have made possible long-distance transmission. Only a few years ago, 150 pounds of line pressure per square inch was high and American engineers were somewhat slow to see the possibilities in technical improvements. But the construction of the 450-mile Ruhr (Germany) line in 1925 with appropriate strength was a challenge to American technology. The first long-distance line in the United States was constructed in 1927 from the Monroe field across the Mississippi River to Baton Rouge, a distance of 170 miles, and subsequently extended to New Orleans, 90 miles farther away.

The longest pipe line now under construction is the one connecting the Amarillo reserves with the Chicago area traversing in its course 975 miles and crossing Oklahoma, Kansas, Nebraska, and Illinois. This line will have a capacity of 175,000,000 cubic feet of gas per day and is the joint enterprise of the Insull interests, Cities Service, Standard Oil of New Jersey, Texas Corporation, and others. When completed it will cost \$75,000,000. The second large enterprise is the construction of a line tapping both the Amarillo and the Hugoton fields. It is to be 867 miles long, of 22- and 24-inch pipe, with daily capacity of 160,000,000 cubic feet of gas. It traverses the Middle West and connects with the Columbia Gas and Electric System. The third line is also from the mid-continent fields and is 800 miles in length. It is sponsored by the North American Company, the United Light and Power, and the Lone Star Gas Corporation. It extends from the Hugoton field in Kansas, crosses Nebraska and Iowa, and reaches Minneapolis and St. Paul, with contemplated extension to Milwaukee. The operation of these three lines alone will increase natural-gas consumption by 7 per cent if operated at only 75 per cent capacity. Present developments indicate that scarcely any important section of the United States will be beyond the reach of natural gas. As it stands, the future of natural gas looks bright. The trend from 1906 till 1930 shows an average annual increase in production of 15 per cent. It is not at all unreasonable to expect this trend to continue for the immediate future at least.

The development of this industry requires an investment of \$25,000 per mile, and several hundred millions of capital annually, it is perhaps entitled to the designation, the fastest-growing public utility. Nevertheless, there are numerous uncertainties in the situation. First, the capital must be amortized within a comparatively short period of time if the risk of exhaustion of supply of gas is to be painless. A more threatening risk seems to be the fear of corrosion of pipes by soil. The industry frankly confesses that engineering knowledge along this line is practically non-existent. Research in this field is in progress but lines are laid before results can even be guessed and it is feared that the average life of the pipe line may not exceed 15 or 20 years.

Problems Created by Natural Gas.—The problems confronting the distributing system which changes from manufactured to natural gas or to a mixture of the two are sometimes difficult at the outset. The average heat capacity of manufactured gas is about 500 B t u, while that of natural gas is about 1,000 B t u. Immediately after changing to pure natural gas on this basis, experience has shown that consumption is roughly cut in two. The company making this change must do so in view of the increased domestic and industrial uses of gas that experience has shown actually result within a short time.

The present situation in Chicago is typical. The Chicago system is so situated that it has for some years used coke-oven gas to the extent of about 67 per cent of its needs, supplemented with water gas for the balance. But since natural gas is twice as efficient as water gas, only one-half of the amount of the latter now used will have to be replaced with natural gas. The contemplated mixture will carry about 800 B t u against the present 530 B t u. The company will rely mainly upon industrial use of gas and house-heating to recoup the lost consumption. On the other hand, the costs of obtaining natural gas would have been slightly more in 1930 than for the manufacture of water gas. In Lincoln the reduced rates in effect after the change to natural gas reduced the average domestic consumer's bill by 40 per cent. But house-heating is making rapid progress and doubtless will be extensively used in the near future, since no fuel of any kind is produced in the state of Nebraska.

A second problem appears in the limited usefulness of the gas plant and holders, which in some cases results in the entire scrapping of this property. This creates an accounting difficulty and may be a source of friction in price regulation by commissions.¹ On the other hand, there is the increased utilization of the distributing system under natural gas. In many cases this will amount to as much as 70 per cent and will postpone depreciation on account of obsolescence and inadequacy of existing distributing systems.

Domestic Use of Gas—For two generations the gas industry maintained itself upon tradition and was confronted by no competition from the outside. The resourcefulness of the men in the industry was not really shown until the gas light was plainly doomed to fail in competition with electricity. This was true notwithstanding the fact that already in the early eighteen thirties James Sharp of Northampton, England, demonstrated the usefulness of gas for cooking in the home. It was not until about 1859 that gas began to be used in this country for cooking purposes and then only as the English stove was introduced. At the Philadelphia Centennial in 1876, gas for cooking was demonstrated and its use received some impetus. But both the gas and the stove were too

¹ See *Report of the Public Utilities Securities Committee of the I B A of A* for 1930.

expensive to receive attention from any except the wealthy classes. It was not until after 1895 with the reduction in the cost of gas and stoves that gas became the medium for heat in the average home for cooking purposes. In fact, the first store where gas appliances were exclusively sold was not opened until 1873 in Providence, R. I.

The extent to which gas has captured the home is shown by the fact that out of 29,200,000 families in the United States, 15,000,000 cook with manufactured or natural gas, 7,500,000 use coal and wood, 5,800,000 use oil; and only 900,000 use electricity.¹ On account of its expensiveness and slowness, the electric range is used mostly where gas is not available and hence little competition exists from this source. The utilization of manufactured gas shows significant changes during recent years. The percentages used for various purposes were as follows:

Year	Lighting	Cooking	Total	Commercial users and miscellaneous
1920	21	54	75	25
1925	15	56	71	29

Figures from J. J. Morgan, *Manufactured Gas*, Vol. II, pp. 173-174

The complete transformation of the manufactured-gas industry is shown by the fact that before the competition of electricity and oil, gas showed a 90 per cent lighting load; at the present time there is a 92 per cent heating load.

Domestic use of gas is making rapid progress for other purposes than cooking. The first additional use for gas in the home was for heating water. Recently the gas association has given much effort to the installation of automatic water heaters to replace the older models. Recently very rapid progress has also been made in the installation of gas for house-heating, house-cooling, and refrigeration (especially in apartments). All of these newer uses greatly increase the domestic load. Domestic consumption of gas has increased 67 per cent during the past 11 years and, in 1930, 70 per cent of all manufactured gas used was for domestic purposes, the remainder going to industries, hotels, restaurants, and other commercial consumers. The average domestic consumer of manufactured gas used 32,700 cubic feet in 1921 and 36,000 in 1929. If house-heating becomes general, as it promises to do under the low rates offered by natural gas, the average consumption of gas is destined to greatly increase, notwithstanding the greater thermal efficiency of natural over manufactured gas.

While the domestic load of gas will continue to be the most important for some time to come, other fields lie at the door of the industry. As

¹ Statistics from American Gas Association

it stands, it appears that manufactured gas supplies only about 2 per cent of the total heat requirements of the country. Samuel Insull estimated that 20 per cent of the bituminous coal now being used could be replaced by manufactured gas, one-half of which replacement would be in the industrial and one-half in the domestic field, also that 75 per cent of the anthracite now used for domestic and industrial purposes and 75 per cent of oil now used for house-heating and industrial heat-treating could be replaced by gas. Altogether these prospective uses amount to about sixteen times the amount of gas now sold. For domestic use alone there is a potential use for house-heating, water-heating, and refrigeration equal to three times the present output of manufactured gas. House-heating and refrigeration await the extensive use of insulation materials in construction so as to cut the cost of these conveniences furnished by gas. These prospects seem to give point to the common assertion that gas will become "the universal" or "ultimate" fuel.

But in certain districts the outlook is not so promising. In Ontario, Oregon, Washington, and Southern California, electricity produced by hydro-electric plants is cheap enough to compete with gas for fuel for domestic use, in bakeries, in restaurants, and for light commercial uses. The increasing habit of "eating out" and buying bread and cooked foods and the improved commercial laundries make inroads into domestic gas consumption. In the Pacific states, however, gas is still the accepted medium for heat. This could be much more satisfactory if only suitable gas appliances were at hand to replace the present primitive, odorous heaters. Even in certain eastern cities the average gas bill is falling and now stands as low as \$20 per year. In regions of cheap coal and wood, these fuels also furnish competition, while in California oil is an active competitor.

In order to realize its program of expansion, the gas industry is revolutionizing its methods. It is rapidly improving its engineering, scrapping old ideas, improving gas appliances, modernizing rate-making, building economical loads, and improving sales-promotion methods. It must also utilize more coal gas and find a market for the coke by-product. In speaking of the accomplishments of 1928, Mr. Forward, managing director of the American Gas Association says "The present year has brought to gas men in America the keen realization that out of scientific research wisely planned and courageously prosecuted will develop a gas industry undreamed of 10 years ago."

Gas in Industry.—One of the most promising fields for gas is for fuel and for heat-treating processes in industry. Although for many years gas has been used for heating glue pots, candy kettles, butchers' caldrons, and the like, it has been only within the past 10 or 15 years that gas has begun to be extensively used in industry affecting some 21,000 industrial operations. About one-fourth to one-third of all manufactured gas is

now used for industrial operations, while heat-treating processes account for over 30 per cent of the gas output of the country. It is used most extensively in bakeries and candy factories, in roasting coffee, smoking meat, pasteurizing milk, pressing clothes, melting glass and metals, forging, heating rivets, galvanizing, welding, and so forth

Everywhere gas is proving itself economical, clean, convenient, and instantly available, it leaves no waste materials to be disposed of, requires no working capital, and causes no worry about prices. In large industrial plants natural gas saves about 30 per cent over coal and 20 per cent over oil. When used directly for fuel, engineers estimate that 95 per cent of coal is wasted. But 1 ton of coal used in the manufacture of gas will produce 1,400 pounds of smokeless fuel, coke, 10,000 cubic feet of gas, 25 pounds of ammonia sulphate, $1\frac{1}{2}$ gallons of benzol, and 9 gallons of tar. The Mellon Institute of Pittsburgh estimates that the smoke of that city results in an annual loss and damage of \$10,000,000 which is equal to the annual domestic fuel bill.

Gas Research.—Like many other industries within recent years, the gas industry has begun to appreciate the importance of industrial research for its future. The backwardness which characterized the industry in this respect in the past is rapidly changing the picture to one of progress. A landmark in the industry was passed when in 1925 the American Gas Association established for the entire industry a testing laboratory at Cleveland, Ohio, the center of gas-appliance manufactures. The efforts of the laboratory were first directed to testing gas appliances for safety and efficiency in operation. Those that passed the maximum of safety and minimum efficiency test were allowed to use the association laboratory's Blue Star Seal. Practically all of the larger gas-appliance manufacturers in the United States have submitted their products for testing. This work progressed so rapidly that, in 1928, 75 per cent of the gas ranges sold, 60 per cent of the space heaters, 50 per cent of water heaters, and 30 per cent of gas-fired furnaces and gas boilers bore this label. After 1928 the Blue Star Seal was reserved for those homes completely equipped with gas appliances.

More recently the laboratory has taken up the task for the development of specific lines of research in forging, steel treating, baking, brass melting, and so forth with the idea of developing the most efficient gas appliances and so increasing the use of gas. Attention is also devoted to the most economical production of mixed gases.

Gross Operating Revenues.—The gross operating revenues of gas companies present a picture of continuous growth and stability rarely found in any industry. Every year of the decade 1919-1928 witnessed a substantial increase in gross revenues. The depression years following the war made no appreciable impression on operating results. The increase during this decade was from \$285,000,000 to \$519,000,000, or

an advance of more than 82 per cent Revenues for both 1929 and 1930 were \$533,000,000

Analysis of the sources of revenue within the same decade throws light upon the underlying forces responsible for the remarkable showing. The total number of cubic feet of gas sold during this period increased over 60 per cent, every year showing a substantial increase over the year preceding. In fact no year since 1905 has shown a decrease in the amount of manufactured gas sold in the United States. In the past decade domestic sales have shown a continuous increase amounting to 55 per cent in all, but gas sold for industrial and commercial purposes increased 110 per cent. Domestic sales are still $2\frac{1}{3}$ times commercial and industrial sales. While the latter have shown a great stability from year to year, the domestic sales are chiefly responsible for the enviable record.

The average rates received for gas showed a moderate decline down to 1917 from which date they gradually rose to \$1.32 per 1,000 cubic feet for domestic use. For the past few years the rate has stood at about \$1.28. The population served increased from 43,380,000 in 1919 to 53,930,000 in 1927, and the number of customers from 8,484,000 in 1919 to 11,800,000 in 1928. The revenue per customer has increased in the decade from \$33.60 to \$44.00 with the sales per meter showing a corresponding increase.

Operating Expenses.—The operating expenses in the gas industry show a favorable trend since 1923, the first year in which statistics are available. With reference to the type of material used, the lowest individual company costs occur in the coal-gas plants. The ability to dispose of coke at a good price greatly reduces the fuel bill even wiping it out entirely in some cases in the State of Wisconsin. The size of the community or annual gas sales have a marked effect on gas costs. A drop in cost per 1,000 cubic feet of as much as 25 per cent is observed in plants of 85,000,000 cubic feet capacity, with continued economies as production increases.¹ As in the electric light and power industry the total cost of producing gas is accounted for mostly by the cost of distribution. Costs will vary inversely with the density of population and the number of customers served. The accepted standard of measurement here is the number of people or customers per mile of main. For the manufactured-gas industry as a whole in 1927, the population served averaged 592 and customers 125.

Taxes.—Taxes have mounted absolutely in gas companies as they have in all other utilities. But the relative trend is unfavorable, since they rose from 8.7 per cent of operating revenues in 1923 and 9.5 per cent in 1927. They also increased more rapidly when compared with operating expense (including taxes) from 11.4 to 12.7 per cent. When measured according to thousand cubic feet of gas sold, the showing is also unfavor-

¹ *Utilities Magazine*, Vol. I, pp. 19-23

able When compared with income available for dividends and surplus, however, a more favorable showing is observed In 1923 they constituted 45.5 per cent and in 1927 the figure was 44 per cent Taxes per 1,000 cubic feet of gas are much higher for the smaller than for the larger companies The burden of state and local taxation ranges from nothing in Pennsylvania to as high as 10 cents per 1,000 cubic feet in some states

Operating Ratio.—With increased volume of business and decreased expenses per 1,000 cubic feet of gas sold, the operating ratio, before taxes but after depreciation and retirement expenses, has steadily declined from 67.6 per cent in 1923 to 65.1 per cent in 1927; after taxes the figures stood at 76.2 and 74.6 per cent, respectively

Net Income.—The net income from operations is considerably augmented by non-operating revenues These have amounted to over 20 per cent within recent years Total gross revenues available for capital charges have shown a steady increase since 1923 They have also shown a tendency to increase when compared with fixed charges and operating revenues In 1923 fixed charges were earned 3 times over and in 1927, 3.1 times, while they were 9.7 per cent of operating revenues in 1923 and 10.2 per cent in 1927 This represents a high standard for an industry that continues to grow as the gas industry does In a recent study of financial ratios made by the Bureau of Business Research of the University of Illinois for the years 1920, 1923, 1925, and 1926, combined data show that typical (modal) companies in the manufactured-gas field earned 6.6 per cent on total assets After deducting interest on debt, net income was 8.5 per cent on net worth and net profit to common-stock equity was 8 per cent Natural-gas companies did not fare so well, the figures which correspond to the above for these companies are 5.6, 5.3, and 5.6 per cent¹

Assets of Gas Companies.—Although many gas companies are operated in combination with other types of utilities, it is possible in most cases to separate the gas plant and property from other kinds of property. Of the total assets of gas companies, almost 90 per cent is represented by fixed capital and about 8 per cent by current assets The typical manufactured-gas company has fixed assets over 85 per cent of total assets and over 60 per cent for natural-gas companies² The current ratio for gas companies is habitually low, as in the case of most public utilities Forty-eight per cent of the number of manufactured-gas companies investigated by the University of Illinois Research Bureau showed current liabilities equal to or greater than current assets, while 53 per cent of natural-gas companies showed the same condition Something like one-third of all companies showed current ratio from 1 to 2.³

¹ *University of Illinois Bulletin* 37, p. 40

² *Financial Plan of Gas Companies, Bulletin* 27, University of Illinois Studies

³ *Ibid.*, p. 33

Capitalization of the Gas Industry.—The study of the finances of gas companies made by the University of Illinois¹ showed that, out of 318 cases, 235 obtained capital through the issue of long-time obligations. Eighty-one per cent of manufactured-gas companies and 58 per cent of natural-gas companies used bonds in their financing. In 65 per cent of the former companies, bonds represented 30 to 60 per cent of the total assets (only 4 per cent had bonds in excess of 60 per cent), while most natural-gas companies financed their requirements out of bonds representing less than 30 per cent of their assets. The typical manufactured-gas company secured 5.6 per cent of its capital from short-time credits and the natural-gas company 6.9 per cent. The fixed capital alone, after deducting retirement reserves, is substantially in excess of the total capitalization. In addition to retirement reserves, a large item of other reserves is set up in the balance sheet. Current and other liabilities almost exactly equal current assets. The interest charge on funded debt is earned three times over and shows a slight tendency to improve.

Bonds.—Gas companies have a long record for safety equaled by few, if any, classes of corporations. In addition, gas bonds have an almost unparalleled record for stability. For a hundred years their record has not been surpassed by municipal bonds. A default in gas bonds is of rare occurrence. The trials of the recent war period caused no great hardship to most of the companies. Defaults in 1921 represented only a fraction of 1 per cent of the capitalization outstanding and only 4 per cent of all public-utility defaults.

Many gas bonds issued by operating gas companies are a heritage of the older period of finance. They are generally closed first-mortgage bonds and likely to carry a sinking fund of moderate proportions and bear a coupon rate of 5 per cent. The properties underlying these bonds are often consolidated with other properties and the bonds assumed by the successor corporation. They retain their caste and are the aristocrats of public-utility bonds. Such are the issues of the People's Gas, Light, and Coke Company of Chicago. They are legal for savings banks in New Jersey and New York. During the 8 years 1923–1930 the interest on all the funded debt of this company was earned on the average $2\frac{3}{4}$ times over. Total funded debt amounted to about \$60,000,000 at the beginning of 1930 against a property valuation of \$141,324,000 (retirement reserve of \$15,000,000) and total assets of \$173,529,000. Provision for refunding these bonds when due has been made. A second example of these early bonds is the two issues of Los Angeles Gas and Electric Corporation. The factor of safety on these bonds is very high and they are legal for savings banks in Maine, Massachusetts, and California. Unlike most early bonds, they are callable at 105.

¹ *Ibid.*, pp. 22–23.

Within the past 25 years, gas companies have looked more to the future in their financing and have largely avoided the restrictions of closed mortgages. An early case in this field is the Refunding and Extension 5 per cent Bonds of the Laclede Gas Light Company issued in 1904 and due in 1934. They are now a first lien on the property of the company and carry an after-acquired property clause. This company in 1923 issued a more recent type, another of this general type of bond, but of more recent improvement in details. This is the First Mortgage Collateral and Refunding Gold Bonds, issuable in series with interest to be determined at time of issue. The total amount of these bonds is limited by law to the authorized amount of the capital stock. The bonds are secured by direct mortgage on all property and on \$10,000,000 of the Refunding and Extension issue. New series are limited to 80 per cent of betterments and the interest in 12 consecutive months of the immediately preceding 15 months must have been earned $1\frac{3}{4}$ times over. If earned only $1\frac{1}{2}$ times, new issues are limited to 75 per cent of betterments. They carry no sinking fund and are callable at prices ranging down from 105, decreasing as the maturity date approaches.

The Los Angeles Gas and Electric Corporation has similar bonds. In addition to the two underlying closed-mortgage bonds, it has a General and Refunding Mortgage Bond of \$31,243,000, issued in series with coupon rates $5\frac{1}{2}$ and 6 per cent. These bonds are legal for savings banks in California, Maine, and Massachusetts. They carry a sinking fund equal to $\frac{1}{4}$ of all indebtedness, less sinking funds applicable the year previous to underlying bonds. They are callable at the beginning at 110 with decreasing figures toward maturity. This issue has been closed by provisions of the later and still more modern First and General Mortgage Gold Bonds authorized to the extent of \$150,000,000. Series may be issued to the extent of 75 per cent of improvements if net earnings equal $1\frac{3}{4}$ times interest and 80 per cent if earnings equal 2 times interest. These provisions may be modified if the holders of four-fifths of the bonds consent. The bonds are callable at a maximum of 105 and carry a small sinking fund. They are secured by mortgage on all property and no prior charge can be created. They are legal for savings banks in California. Interest on funded indebtedness has been earned from $2\frac{1}{2}$ to $4\frac{1}{2}$ or more times over within the 5 years 1926-1930.

An unusual type of gas bond is the 5 per cent Gold Bonds of the Boston Consolidated Gas Company issued in 1927. The bonds of this issue are debentures and were issued to retire preferred-stock issues which bore a higher dividend rate than the interest calls for, thus resulting in a saving for the company. They are protected by the provision that they must be equally secured with any future mortgage placed upon the property, except purchase-money mortgages. These are high-class bonds and their interest is regularly earned $4\frac{1}{2}$ times or more.

Preferred Stock.—Although comparatively few in number, preferred stocks of gas companies are among the highest-class preferred stocks. At the time of reorganization the Laclede Gas Light Company issued a small amount of 5 per cent cumulative preferred stock upon which dividends have been paid continuously since 1889. The Los Angeles Gas and Electric Corporation had \$19,469,000 preferred in 1920.

Most preferred stocks of gas companies carry the voting privilege, while a small proportion of common is non-voting. Altogether one-third of the companies have non-voting stocks. In the typical gas company 9 per cent or more of assets is represented by non-voting preferred and the tendency is on the increase.¹ The typical manufactured-gas company has surplus and reserves equal to $14\frac{1}{2}$ per cent of total assets, while the natural-gas company's ratio is 28 per cent. Yet some companies show impaired capital, 4 per cent in the former and 2 per cent in the latter case. This reflects losses sustained mainly during the war period. On the other hand, 7 per cent of the natural-gas companies had surplus and reserves of 60 per cent of assets.² Altogether while manufactured-gas companies show conservative capitalization, natural-gas companies are even more conservatively capitalized.

Common Stocks.—The common stocks of gas companies as a rule are conservatively issued. They are typically of \$100 par value and have a book value considerably in excess of their par value. The inflation during the war and after reduced the earnings on these stocks. But in time adjustments were duly made and they have fully recovered their high status. Many gas companies have recently been absorbed by holding companies and their common stocks—regrettably so—withdrawn from the market.

Holding Company Securities —Consolidation has proceeded far in the gas industry, the number of gas plants having been reduced from over 1,300 in 1920, to only 715 in 1930.³

With this movement the holding company has assumed more importance in the security markets. In this connection two types of holding companies have developed, the one holding only gas stocks and the other combined gas and electric properties. The latter combination is undoubtedly advantageous, especially since the utilization of natural gas on a large scale. This enables the company to save in overhead and gives the electric company free access to inexhaustible supplies of gas as fuel with all the advantages which this arrangement has shown to exist. In these cases the gas business is of secondary importance.

The securities of the holding company consist of debenture bonds and one or more classes of preferred and common stocks. The bonds rest

¹ *Ibid*, pp 24-29.

² *Ibid*, pp 29, 31

³ Figures from *American Gas Association Monthly*, July, 1931

mainly upon the earning power of the subsidiaries whose stocks constitute the bulk of the assets of the holding company. Yet these bonds secure a large measure of diversification and may be high-class issues. An example of debentures is the \$50,000,000 issue of 5 per cent bonds of the Columbia Gas and Electric Company, due in 1952, callable at 105 and less, and carrying no sinking fund. They carry a protective provision against prior liens of the holding company but specifically exempt the subsidiaries from this provision. In 1929 the interest on the funded debt of this company, after allowing for interest and dividends on preferred, was earned 10.81 times over. There is also an issue of non-voting preferred stock which, however, assumes control when four quarterly dividends are in default. In 1929 the dividends were earned 5.47 times over. The company also has \$145,000,000 of common stock and carries a surplus account of \$93,000,000, together with large reserves. The earnings per share on the common show considerable fluctuation, since they rest upon the common stocks of subsidiary companies. The properties of this company cover a compact territory, mainly in Ohio.

A very different type of holding company is the American Gas and Power Company which controls the gas business in Bangor, Birmingham, Jacksonville, Minneapolis, St. Augustine, and Savannah. It is itself controlled by the American Commonwealth Power Corporation, incorporated in 1929, which controls in addition other gas and electric companies. This latter company is capitalized with an issue of first preferred, a cumulative preferred without vote unless 1 year's dividends are in arrears, and common stock. The first preferred is protected by a provision forbidding the payment of dividends on either the cumulative preferred or the common stock, unless remaining earnings equal two times dividend requirements on the first preferred.

A most interesting example of the pyramiding of companies and securities is found in the Massachusetts gas situation. The Massachusetts Gas Company is a trust form of organization and controls the Boston Consolidated properties and many other gas works of Massachusetts. It has three debenture bonds issues, all callable, and protected against the issue of prior liens of the holding company and subsidiaries as well. They are secured by the stocks of subsidiaries. Two of these issues carry a sinking fund of approximately one-third of the bonds till maturity. But this company is controlled by the Koppers interests of Pittsburgh through the Eastern Gas and Fuel Associates, another trust organization. This company has a 4½ per cent prior preferred stock of \$23,662,200, another preferred of \$40,822,000 with 6 per cent dividend, and no-par common stock. Both preferred stocks have ordinarily no voting power but, if default occurs on four quarterly dividends on either issue, both issues vote equally by class. Both issues are callable, the prior preferred at 105 and the preferred at 110. Needless to say, the securities of this

latter company are in a relatively weak position and would suffer heavily in any decline in earnings

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CHAPTER XXII

WATER WORKS

Pure water in all ages has been the indispensable substance required by all animal and vegetable life. Since there are no substitutes for water, the interest of communities in a common source of supply is as old as community life itself. Thus water works may be regarded as the oldest of public utilities. The growth of modern cities and civilization itself are conditioned upon an adequate supply of pure water. Modern demands require bright, clear, and sparkling water, free from impurities and chemical poisons, and incapable of housing typhoid fever, cholera, diarrhea, or other water-borne diseases. It must have some degree of softness and leave no injurious action on metals and should have sufficient pressure.

Early History.¹—The earliest efforts to obtain a water supply were doubtless exerted in the digging of wells. Many of these old wells still exist today and have become famous in the literature of the past. Perhaps the most famous is Joseph's well at Cairo, Egypt. It is 297 feet deep, carved out of solid rock consisting of a two-part shaft, the upper portion of which is 18 by 24 feet and 165 feet deep, the lower part is 9 by 15 feet and 130 feet deep. Water is raised by means of endless chains, those for the lower level being operated by mules taken to a separate chamber at the bottom of the upper lift through a spiral pathway winding around the well.² Other important wells were located in ancient Greece, Assyria, Persia, and India. The Chinese dug wells over 1,500 feet deep by methods still in use. But the engineering works of ancient days that excite most admiration were for the purpose of conveying and storing water. Underground cisterns are still in evidence in Jerusalem and reservoirs in Carthage. Irrigation works are found widely scattered over the ancient world, the one known as Lake Moens in Egypt being perhaps the most famous. Even about a thousand years before Christ the Jews constructed a water-supply system which is still in use today. It gathered water from natural springs and from the elevated regions of Judea into artificial reservoir ponds, whence it was conducted to Jerusalem. Alexandria constructed reservoirs to catch the overflow of the Nile which was made available for several hundred cisterns. Greece also had private and public wells or springs.

¹ A brief history of water supply may be found in F. E. Turneure and H. L. Russel, *Public Water Supplies*, Chap. I.

² See THOMAS EW BANK, *Hydraulics*, p. 45.

The Romans sought a pure water supply through the building of aqueducts. At first aqueducts were rude ditches dividing water from streams to areas of utilization. Later, ditches were lined and covered with stone and finally the pipe came into use. The Aqua Appia was the first and most famous and was constructed about 312 B. C. Its length of about 11 miles was greatly exceeded, however, by another system almost 40 miles long, constructed about 52 A. D. Altogether ancient Rome had 14 aqueducts, aggregating 359 miles in length, 50 miles of which were covered by arches. Water thus conducted passed into large cisterns and from these was distributed through leaden pipes to smaller cisterns and fountains, to baths, to the public, and to a few private consumers. The public fountains were the sources of immediate supply for the masses of the people. In Constantine's time there were 1,212 fountains. The supply per capita appears to have been very liberal and placed at a minimum of 50 gallons per day.

Middle Ages—After the fall of the Roman Empire, water supply fell into decadence and the pure water for which Rome was famous gave place during most of the Middle Ages to grossly polluted supplies, to which can be largely traced the pestilence and diseases of the times. About the end of the sixteenth century improvements began to appear. Aside from some feeble efforts to procure pure water in Paris, London, Hanover, and other places, the population of those times depended upon the adjacent rivers for their water, just as Rome depended upon the Tiber before the era of aqueducts.

Modern Water Works in Europe.—As early as the beginning of the seventeenth century Paris constructed some aqueducts, but even at the end of this century the per day per capita supply was only $2\frac{1}{2}$ gallons. London made real progress when in 1619 the New River Company was incorporated to bring water from the New River to London. This supply was distributed to individual households by pipes, thus inaugurating a new era of municipal water supply. In the eighteenth century steam pumping was employed and was responsible for rapid development of water works. London employed this means of lifting water first in 1761; Paris followed in 1781.

The nineteenth century brought great development in modern water supply. Paris constructed two aqueducts, 81.5 and 108 miles in length, which carried pure spring water. In 1890 Paris supplied its population with 65 gallons per capita per day, only one-fourth of which was from springs and fit for drinking, while the balance was drawn from rivers. In 1892 another aqueduct increased the per capita daily drinking supply from 16 to 28 gallons.

In 1904 the city of London took over the eight separate private companies which had hitherto supplied the city with water. At that time only 20 per cent was from wells and springs, the rest being filtered river

water But the rate of growth of systems was slow in the first half of the nineteenth century The second half saw a rapid spread over most of Europe

Prior to the beginning of the nineteenth century, the larger pipes were usually of wood made by boring holes 6 or 7 inches in diameter in logs After that cast-iron piping came into use, London outfitting its system in 1820 with the newer material Until 1873 the system known as the intermittent-supply system was used in London as elsewhere This supplied water at intervals only and for only a few hours of the day In 1891, 35 per cent of the total water supply in London was still from the intermittent system Filtered water made rapid progress in Europe in the nineteenth century until today practically all cities use filtration methods for surface water of all kinds

Water Works in the United States.—From early times American colonial cities made rapid progress in water supply In 1652 Boston first brought her water supply from springs by gravity and served both for domestic use and for fire protection When the population reached 20,000 in 1796, this was supplanted by a pumping system drawing the supply from Jamaica Pond 5 miles distant Bethlehem, Penn., first used pumps in 1754, the earlier ones being wooden and the later ones iron Providence followed in 1772 with a water system and Morristown in 1791 As nearly as 1774, New York began a municipal water system but failed to carry it to completion In 1779 a private company receiving financial assistance from the city built a system which by 1823 comprised 25 miles of main and 2,000 taps In 1830 the city built its own water works for fire protection which supplemented the private system and later became the Croton system Philadelphia began the first successful municipal water system in 1798 when the city had 80,000 population, drawing its water from the Schuylkill River and using steam pumps and cast-iron water mains

Other early water works were established in Worcester, Mass., and Portsmouth, N. H., in 1798, and at Albany, N. Y., the following year But New Orleans had no central water supply system until 1836, Buffalo, N. Y., had none till 1852, Cleveland first established its system in 1853 and San Francisco in 1857. Chicago had water since 1840, 3 years after it was founded The first use of the steam engine was at Philadelphia in 1800

Aside from the improvements just noted, not much progress was made until the second half of the nineteenth century The two decades 1860-1880 mark the general spread and development of public water supply. This was to a great extent occasioned by the adoption of the modern centrifugal pump, driven by steam turbines This enabled even the smaller cities to have adequate systems. From 1880 to 1890 came the period of rapid expansion in water-works systems. It was accom-

panied by great speculation in water-works securities. So rapid was the progress that, by the close of the century, scarcely a city of 2,000 population could be found that did not have its own water supply. By 1896 the number of public water works in the United States was 3,196 (in 1850 there were only 83), two-thirds of which were established after 1885.¹ Already by 1890 almost 23,000,000 people were served with public water-supply systems.

Technical Improvements.—After 1870 the old filters of gravel, charcoal, or sponge gave place to slow sand filters modeled on the English type, followed in 1893 by the modified form in Lawrence, Mass. By the end of the century more than nine-tenths of all filters were of this type. In 1925 there were 587 rapid and 47 slow sand filters in use. The use of chlorine for surface waters dates from 1908. In the early history of water companies, ordinary rivers and lakes were the most common sources of supply. Sewerage systems were less numerous than now and pollution from this source and from industrial development was frequent. By the nineties filtration became a necessity, first to remove color and turbidity and later bacteria.

The use of the water meter came only gradually. Although this method of measuring the amount supplied to each customer is very old, even in 1891 there were only 37 cities having 50 per cent or more of their taps metered. Not until about the end of the nineteenth century did the old steam reciprocating pump fired by wood and coal and the water-power pump give way to the vertical triple-expansion pump which puts plants on a new basis of efficiency and capacity. These were supplemented by higher-duty pumps, mostly of the centrifugal type of much smaller size and expense, driven by steam turbines or electric motors. Internal-combustion and Diesel engines are used widely in the smaller places.²

The distribution system of a water works should have durable pipes laid deeply enough so as to avoid damage from frost or street traffic, strong enough to withstand maximum pressure, capable of sectional isolation so as to repair damages at any point without interfering with the operation of the main system, a liberal number of hydrants, district meters, and means of detecting leakage and waste.

Water Supply.—A thoroughly sound water system will require that the supply be adequate, if not inexhaustible, from year to year. The ideal system would demand that the current flow be adequate to take care of all possible maximum demands for shorter or longer periods of time.

¹ *Manual of American Water Works, 1891-1897*

² American water works of special note are the New York City Catskill Aqueduct, which is the largest ever constructed, the Chicago system with its long intakes from Lake Michigan, and the Los Angeles system with its 210-mile aqueduct reaching to the eastern slope of the Sierra Nevada Mountains.

But this degree of perfection is not always possible and it is, therefore, necessary to store water in reservoirs in periods of abundant supply or low demand, to make provision for the maximum demand or slack flow. Anything less than this would meet the harshest criticism and may lead to sacrifice on the part of consumers. A good water system will have sufficient capacity to meet the expected needs for 25 to 50 years in the future. This involves a probable increase in population and in industrial needs for water. The character of the population, the locality, and its industries affect the estimates. Almost always the rate of utilization per head will show an increase. But there are wide differences in the amount of water consumed per head in various communities. A small industrially undeveloped town in New England uses 18 or 20 gallons per head per day. Large commercial cities use generally 35 to 40 gallons, while many cities use anywhere up to 100 gallons or more. London used 34.7 gallons per head in 1927; 21.7 was for domestic purposes, 9.1 for trade and shipping, 1.6 for municipal consumption, and 3.6 for miscellaneous use. The higher average in the United States is due to a generally higher standard of living and more lavish use as well as to waste arising from leaks in faulty distribution systems. An investigation covering 136 cities of 25,000 or more population showed that on the average, where less than 10 per cent of the services are metered, consumption per head was 128 gallons, but, where meters were used for 50 per cent or more of service, consumption was only 52 gallons per head per day.¹

Location of Supply.—The location of the water is next in importance. Three possible cases come up here for consideration. The ideal case is where the water is drawn from elevations far above civilization in mountain streams, springs, and lakes, whereupon it is stored, if necessary, in reservoirs built for the purpose and delivered to consumers by the gravity system. In the long run this is by far the most satisfactory situation from the standpoint of quality, freedom from infection, and economical operation. The second case is that of underground sources, springs, wells, and horizontal galleries. Here the quantity is a matter of artificial preparation for utilization and need never be inadequate. The quality depends upon the region and underground geological formations. The disadvantages of this source of supply are usually hardness of water, expensiveness to pump from the wells, and inadequacy of supply. Such a system must always be provided with adequate reservoir capacity. Where the water is pumped directly into the mains, duplicate pumping equipment makes the supply more expensive. Such water, however, is free from germs. The third condition is that of utilization of surface water from rivers, lakes, and minor streams. Precaution here is necessary to insure the supply from contamination. Such systems require filtration plants for purification, which add to the expensiveness of the

¹ See article by H. J. F. Gourley in *Encyclopaedia Britannica*, under Water Supply

supply The water from this source is softer than that from underground wells.

As a rule, the larger cities use surface water, so that the majority of people depend upon surface water. Nevertheless, the larger number of water works draw their supply from wells.

The water-supply systems in many states were subjected to severe tests by the drouth of 1930. Twenty or more states, mostly in the Middle West, experienced the severest drouth on record. The Ohio Health Department made a study¹ of the water supply in 1930 covering 115 public water systems. Its main conclusions were as follows: (1) the underground supply systems were not seriously embarrassed, (2) those drawing their supply from surface sources were seriously embarrassed by (a) shortage and (b) disagreeable tastes and hardness of water, (3) rural supplies in public wells were almost entirely depleted. Since 1930 the public has generally been aroused to better water-supply systems. It was also found that the drouth brought greater demand for water from domestic consumers, which offset the lessened demand for industrial uses occasioned by the severe depression in business.

Procuring of the water itself involves two methods, gravitation and pumping. In gravity schemes the amount of storage must be sufficient to give a continuous supply and pressure even at the lowest drawn-off level. Soft impounded water should be filtered before entering the main aqueduct to avoid lessened capacity (as much as 40 per cent in 20 years) through tuberculation and encrustation. In some cases spring water has to be filtered to avoid polluted supplies. In case the supply is drawn from lowland rivers or lakes, water must be screened and afterwards pumped into a sedimentation basin, then filtered, hardened or softened, and sterilized, after which it is pumped into the service reservoir. Water drawn from deep wells or galleries dispenses with these processes with the exception of softening. These modern improvements render the choice as to source of supply largely an economic question of costs. In gravity systems the initial capital cost will be high, since provision must be made at once for large potential future demand, so that at the time of installation only about 25 per cent of the capacity will be necessary to supply the present population. In pumping systems initial capital outlays are much smaller, since additional wells may be bored as necessity demands and reservoirs may be built also as needs arise. But operating expenses in this method are invariably higher.

The legal right to obtain water from known supplies is a complicated question which must be dismissed with a few summary statements. In the humid districts of the United States the law makes an effort to utilize the water supply for the common good. In the more arid regions of the West, priority of occupancy or appropriation seems to establish rights

¹ See *Journal of American Water Works Association*, July, 1931.

In any case the bond attorney should make sure that the supply has a firm legal basis

Ownership of Water Systems.¹—At the beginning of the nineteenth century there were 16 private and 1 municipal water system in the United States. The nineteenth century saw a complete transformation in ownership and management of water systems. Although municipal ownership gained steadily throughout the century both positively and relatively to private systems, it was not till after 1890 that the municipally owned systems outnumbered the privately owned. In 1924 there were 7,000 public and 3,000 municipally owned water works in the United States, or 70 per cent public and 30 per cent private. But already in 1890 of the 22,678,000 population supplied with water works, about 62 per cent were served by municipal works; at the present time between 85 and 90 per cent of the people are using water supplied from municipally owned plants. Privately owned systems are still popular in the New England states, California, Kentucky, Maryland, New Jersey, West Virginia, and New York, while in the South and West in general, as well as in Canada and United States possessions, municipal ownership has largely taken the field.

Municipal water works are especially popular in the Missouri River Valley states of Missouri, Iowa, Kansas, Nebraska, and South Dakota, where there were 847 municipally owned and only 79 privately owned in 1929. In 1920, of 204 cities of 30,000 or more population, 155 owned a municipal water system. Indianapolis is the only large city supplied exclusively with a privately owned system, although private systems operate in San Francisco, Denver, and Birmingham.

Only a few states have undertaken to regulate rates for municipal water works. In California and Wisconsin the respective commissions regulate municipal water works. The general object of municipal plants is to sell service at or near cost, lower than private plants if possible, and provide a sinking fund for water bonds. Unsuccessful municipal water works usually are found to give service below cost. The courts in Wisconsin decided municipally owned systems were subject to principles of regulation the same as privately owned plants. They are allowed 8 per cent on the investment over taxes.²

Municipal Bonds for Water Works.—Provision is made in almost all states for the issue of water or public-utility bonds in general on the credit of either the municipality or the utility concerned. Because of the widespread municipal ownership of water works in the United States, special provision beyond the usual debt limitation is provided in many states. For instance, in Massachusetts bonds to the extent

¹ See *Manual of American Water Works Association*, 1925.

² In a number of states, Nebraska, Iowa, South Dakota, and others, "home rule" prevails as to regulation of private water companies.

of 10 per cent of the assessed property valuation for water works are allowed. In New York, California, Louisiana, Tennessee, South Carolina, Washington, and Montana, no limit is placed upon water bonds. In other instances, smaller percentages in addition to usual indebtedness are allowed, sometimes approval at the polls being required. In Alabama, Iowa, Kansas, Kentucky, Missouri, Texas, and Utah, bond issues for water works are limited according to the size of the city. In still other cases, water bonds constitute a part of the general indebtedness of municipalities which must stay within certain limits, which, however, in some cases are rather high and perhaps ample to take care of ordinary requirements.¹

Main Uses of Public Water Supply.—The original, and still the predominant, use of water supplied through community systems is for domestic use. Too often, however, the smaller city constructs a system more with the idea of fire prevention than for securing a supply of fresh, pure water for domestic purposes. Another common use of water is for flushing sewer systems. This method of disposal of sewage is recognized to be by far the most satisfactory of any and requires a large amount of water. Water-supply systems are also utilized to a large extent for commercial purposes. Large amounts are used in the refining and manufacture of sugar, manufacture of starch, bleaching and dyeing houses, chemical works, gas factories, boilers, and elevators. The municipal government requires large amounts for fire protection, street sprinkling, sewer flushing, parks, and fountains.

Taxation of Water Works.—On account of the fact that rates in public utilities in general were fixed or conditioned by charters, franchises, or laws before the advent of regulation by commission, the burden of taxes was borne by the security holders. But under commission regulation, which proceeds on the cost plus basis, all federal and state taxes are regarded as part of the cost. Municipally owned water works, almost without exception, pay no taxes on property located within the municipal corporation, but property located outside the corporation is subject to the local real-estate taxes. In practice, however, the taxes paid for this latter reason are negligible. Privately owned plants pay taxes on their property and business. In a few states water works are classified as public utilities for taxation purposes and are given special treatment, while in others the tangible property is treated the same as that of any other corporation. In a majority of cases the local assessors have the power of determination as to the method of treatment in assessment. Many states still have local assessment, while the most progressive ones have gone to state assessment or exercise effective supervision over local assessors.

¹ *Water Works Practice*, pp. 549-552

Tax data on private plants collected by the American Water Works Association for 1923 show that 323 companies with assets of almost \$150,000,000 and gross receipts of almost \$20,000,000 paid \$2,327,993 in taxes. This amounted to 11.81 per cent of their gross receipts and 38.53 per cent of their net income before taxes. On account of the higher ratio of assets to gross receipts in water plants as compared with other utilities and corporations in general, the ratio of taxes paid to gross receipts is quite generally twice or more that prevailing in other types of business. The ratio of taxes to net income before taxes is also somewhat higher than the average for other corporations. The increase in taxation for privately owned plants since 1923 amounted to almost 100 per cent. It is claimed that the readjustment of the tax burden has been less in water companies than for any other class of utilities, owing to the fact that they were less adversely affected by war conditions than other utilities.

Gross Revenues.—Data collected from 45 water works under the auspices of the American Water Works Association, covering the period 1915–1923, give us a valuable picture of the trend in water-works finances. In no single year did water revenues decline in this period, which includes the severe depression of 1921. The increase in revenues for the period amounted to 81 per cent, an average of 10 per cent per year. This increase was due to three causes. First, the population increased 28 per cent, which accounts for about 25 per cent increase in revenues, second, increase in the use of water per capita in this period accounts for 35 per cent increase, and, third, increase due to advance in rates amounted to about 20 per cent. The per capita increase in business amounted to 35 per cent, if to this is added the increase due to increase of rates, the result is 55 per cent per capita gross annual revenue increase.

The increase in per capita revenues was much larger for private than for municipally owned plants, owing to the cost plus basis including taxes, depreciation, and other charges not found in the latter plants. The gross revenues of water system increased also during 1930, a severe depression year. The revenues of the water properties operated by the American Water Works Corporation and the Federal Water Service Company, serving some 470 communities widely scattered over the United States, shows that revenues actually increased 5.14 per cent over 1929. Water works located in industrial centers where large amounts are used in industry show the effect of business depressions. The gross revenues of the Ashtabula system showed declines in both 1924 and 1927, years of only mild depression.

Operating Expenses.—The operation of water works is practically immune from labor troubles and wage advances, since so little labor is required. Water works are almost automatic in their operation, except for repairs and scientific attention to supply conditions. How-

ever, the data referred to above show that operating expenses during the interval 1915-1923 increased 127 per cent (including maintenance expenses and taxes but not depreciation) About 25 per cent of this was accounted for by increase in population, 25 per cent increase on the basis of the old population, and 75 per cent due to price changes occasioned by the war On the per capita basis, it amounted to 25 per cent normal increase and 75 per cent abnormal due to the war and inflation, this compares with a 20 per cent increase in rates

Depreciation—The determination of depreciation charges for water works is still in a formative stage ¹ This is due to the general failure of men of a generation ago to appreciate the significance of this item and also to the failure of the courts, prior to the Knoxville decision, to allow revenues to meet it It is only recently that accounting records have been sufficiently developed to admit of determination of abandonment losses Consequently the accounting records of depreciation leave much to be desired.

Records of a limited number of water works covering periods of 22 to 67 years, representing the best depreciation records available, show a range of 1 to 1.5 per cent of annual reproduction cost ² In the case of the Spring Valley Water Company on the basis of 1913-1914 reproduction cost, 1.16 per cent was allowed, while in the Denver Union Water case as of the same reproduction date, 1.35 per cent was allowed. The amount allowed will vary with the character of the plant, depending upon the nature of the source of water supply, type of structural material used in construction of conduits, whether the gravity or pumping system prevails, and the nature of the layout of pipes with reference to future requirements All of these factors influence the life of the plants and depreciation allowance must be provided accordingly.

In the actual calculation of depreciation, different parts of the water plant have different life periods and each must be figured separately For instance, boilers and pumping machinery last from 15 to 40 years, distributing systems from 30 to 100 years, filter plants of masonry construction 35 to 40 years, while sources of supply with storage dams and appurtenant structures are assigned periods ranging from 40 years to unlimited life On the whole, the period of life of water plants exceeds by far that of other classes of utilities and for this reason the sinking-fund method of calculation, instead of the straight-line method, has the approval of engineers and the courts. In the two recent cases referred to above, the sinking-fund method of calculation was approved It was shown that the straight-line method results in excessive charges in the early years, because of the relative slow rate of depreciation in the early years and the accelerated rate of the later years. The

¹ *Water Works Practice*, p. 524

² *Journal of American Water Works Association*, p. 382, 1919

sinking-fund method assumes that the depreciation each year of the life of the plant would be met by the increase in value of the sinking fund. The 4 per cent interest rate is generally taken because it gives the most satisfactory curve. While this at present is calculated for the plant as a whole, more accurate determination would demand a schedule for each division or group of structures with different life periods. Courts and commissions are determining depreciation allowance more and more in the light of experience of individual plants instead of strict mathematical formulas. The original cost of water works is usually unknown and in the actual calculation the base is either the probable cost or the reproduction cost. The reserve itself has always been held as vested in the property. Practice as to its disposition varies. In some cases the fund is on deposit with banks, while it is used for temporary financing in others; in still other cases it is used for permanent financing of improvements and betterments. It turns out that the accrued depreciation in plants of something like twenty years of age is actually from 8 to 10 per cent and in those forty or fifty years old, from 13 to 16 per cent. This is owing to the gradual additions to supply, filter plants, pipe lines, and betterments that have been made from time to time, so that the accrued depreciation is such as the proportionate expiration of the service life would indicate.

The principle of calculating depreciation on the basis of present value, which contains a large element of cost of reproduction for rate-making, appears to have wide sanction of courts. In a recent case¹ the Supreme Court said, "It is a settled rule of this Court that the rate base is the present value, and it would be wholly illogical to adopt a different rule for depreciation."

Operating Ratio.—The operating ratio for water companies is among the lowest of any class of corporations. For gravity systems, including taxes, it amounts to only about 25 per cent of gross and for plants having to pump and filter the water, between 40 and 50 per cent. Data on systems controlled by the American Water Works Corporation and the Federal Water Service Company show combined operating ratio, after making allowance for maintenance, retirement fund, and taxes, of 47.6 per cent in 1930. In the same year the Federal Water Service operating companies showed an operating ratio of 33.5 per cent before taxes and 27.8 per cent before taxes and depreciation. After allowing for taxes and depreciation, interest on all obligations of parent company and subsidiaries for the two companies was earned 1.91 times over. Consolidated accounts for these two leading American systems are shown in Table 45.

Net Annual Revenue.—The net annual revenues of water companies applicable to depreciation, interest, dividends, and surplus increased

¹ United Railways and Electric Company of Baltimore vs. Harold E. West *et al.*, 280 U. S. 234 (1930).

TABLE 45—OPERATING RESULTS OF WATER WORKS
(000 omitted)

Account	American Water Works (1930)	Federal Water Works (1930)	Total
Gross receipts	\$14,518	\$17,208	\$31,726
Operating expense and taxes	6,134	7,276	13,410
Gross profit	8,383	9,930	18,313
Interest and amortization	3,851	4,836 ¹	8,687
Retirement	750	949 ²	1,699
Net profit	3,782	4,145	7,927
Operating ratio, per cent (includes taxes but not retirement)	47 4	47 7	47 6
Interest, times earned (after retirement allowance)	1 98	1 86	1 91

¹ Does not include amortisation for bond discount² Includes amortization of bond discount

57 per cent in the period 1915-1923. Only in 1917 did they decrease. A number of cases can be found where the net showed considerable decrease during the war period. This was mainly due to rising costs and failure of the commissions to act promptly to relieve the situation. The lag of rates behind expenses for the war period has been placed at 18 months. On the per capita basis the net annual revenue (after taxes) for this period for private companies was 24, and 34 cents for those publicly owned, or 26 per cent for both classes taken together. The net annual return after taxes and depreciation in 1915 for privately owned plants amounted to about 5.3 per cent and for 1923 about 6.6 per cent on the pre-war basis of valuation. But in the interval it has been estimated that an index of the cost of construction of water works increased 100 per cent. On the post-war basis of valuation the picture could be made very roseate indeed. The insistence of the courts that reproduction cost be made the dominant element in valuation, taken in conjunction with the fact that the property of water companies is of a permanent character and was mostly already constructed in the early part of the twentieth century would require a radical revision upward of water rates in order to produce the 7 or 8 per cent return allowed by these same authorities.

Assets.—Water works have a larger percentage of their assets in fixed property than any other class of utility. It is claimed that 90 per cent of the original value of a private water plant is made up of steel and iron. The life of a cast-iron distribution system protected by modern methods is considered to be an indefinite number of years, say, 100. In consequence, less depreciation is usually charged than in other utilities. A large percentage of asset values of a water plant is in the distributing system which is underground and hence immune

from weather conditions, fire, and the like. So secure are water works from calamities that no system has ever been known to suspend service for this reason, not even in the case of the Galveston flood or the San Francisco earthquake. On the other hand, constant vigilance may be necessary in construction, since defective materials are hidden from general observation. Examples of defects in construction, however, are confined usually to the promotional period of the eighteen hundred eighties.

Investment for fire protection varies from 25 per cent of total investment in large water works to 70 per cent in small systems, as much as 50 per cent of operating costs may be due to fire protection. For Portland in 1924, estimates are 77.9 per cent for domestic and 21.1 per cent for fire purposes. The burden of fire protection is not yet generally equalized between water users and the municipality at large. Kansas made a good attempt at this in a special statutory levy.

Corporate Organization.—Most of the 3,000 private water systems of the United States are independently owned and operated and pursue their even and monotonous course from year to year. On the other hand, there are two notably large groups controlled by two holding companies, the American Water Works Corporation and the Federal Water Service Company. The former in 1930 was composed of 42 water-works systems operating in 16 states and Cuba, serving 3,427,380 customers in 218 communities, including Birmingham, Chattanooga, East St. Louis, St. Joseph, and Little Rock. The main properties of this group have been controlled by identical interests for some 20 years. The Federal Water Service, a more recent organization, serves 250 communities with 2,500,000 population, located to some extent in concentrated areas of a number of states, among which are California, Alabama, New York, New Jersey, Pennsylvania, Oregon, and Washington. This group has subsidiaries that operate for the most part within a single state and named after the state, as California Water Service Company, Illinois Water Service Company, and so forth. Profound benefits doubtless come from these consolidations in the way of social service through their well-equipped corps of engineers and specialists in water supply and sanitation. The need for financing by the holding company has never been so imperative as in the case of rapidly expanding utilities. Water companies of necessity must look far ahead and the properties are of long life, while the operation of a water plant is among the simplest of all types of enterprise, becoming almost automatic in its daily routine.

Capitalization.—Operating water companies are usually capitalized with 60 to 65 per cent in bonds, about 15 per cent preferred stock, and the balance in common stock. While this is the traditional set-up, changes are occurring through the influence of consolidation. Consolidated properties show a tendency to eliminate the preferred stock

from public ownership, it being acquired by the holding company, so that in these systems bonds and common stock represent the chief interest of the investor. The economy of acquiring these preferred stocks is evident when one considers the fact that they carry dividends of 6 to 7 per cent, while the holding company bonds are issued on a $5\frac{1}{2}$ per cent basis. Capitalization has been almost universally conservative since the pioneer boom days of the eighties. Consolidated capitalization of the Federal Water Service Company shows plant and property account, less depreciation reserve, of \$157,000,000. Against this, subsidiary bonds amount to \$97,000,000, or 62 per cent of the depreciated plant and property account. The holding company has another \$7,000,000 of bonds. Preferred stocks of subsidiaries and holding companies amount to \$36,462,000.

Bonds.—Bonds of operating companies written before the war are of the traditional first-mortgage closed type. They bear interest usually at 5 per cent, regardless of the location of the property. They were issued to cover 60 per cent or more of the cost of the property, the interest will be earned from $1\frac{3}{4}$ to $2\frac{1}{2}$ or more times over. These standards are permissible because of the stability of revenues previously spoken of. Nevertheless, in many cases insufficient margin in earnings excludes the bonds from the legal lists of the various states.

Bonds issued within recent years show the same transformation of type noticed in the case of electric light and power bonds. The old closed-mortgage type is now seldom issued, its place is taken by an open mortgage which admits of additional issues in series when funds are needed. These issues mostly conform to a pattern developed recently for water companies. The first open-mortgage bond of the Arkansas Water Company issued in 1926 is a typical example of this new type. It provides for additional series to be issued to the extent of 80 per cent of cost of new property, provided interest is earned $1\frac{3}{4}$ times over in 12 consecutive months out of the 15 immediately preceding. It provides also that 5 per cent (in other companies this may be 4 to 9 per cent) of gross shall be charged to operating expenses for repairs, renewals, and maintenance. It carries an after-acquired property clause so that all series issued in the future will rest upon the identical mortgage. The issue is callable at 105 and down and bears a 5 per cent coupon. The open mortgage of the Birmingham Water Company makes a special provision of 5 per cent of gross for repairs and maintenance plus an additional 4 per cent of gross for retirement reserve. The habit of charging a certain per cent of gross for repairs, reserves, and depreciation is perhaps justified in water companies on account of the stability of earnings.

Holding Company Securities.—The capital structure of the holding company in the water industry imitates feebly that of the more highly pyramided utility companies in other fields. The outstanding example

is that of the Federal Water Service Company. It has \$7,000,000 of 5½ per cent gold debenture convertible bonds issued in 1929. They are protected by a provision forbidding any further debentures except for retiring of funded debt already outstanding, unless consolidated net earnings equal three times interest on all the funded debt of the company.

The New England Water, Power, and Light Associates issued in 1928 a 5½ per cent collateral lien gold bond running for 20 years. The stocks of subsidiaries are deposited as collateral. Other bond issues are permissible under this indenture to provide funds to the extent of the cost of new property of subsidiaries, provided the securities received in exchange be deposited as collateral. Also, additional collateral trust bonds may be issued if voting securities on newly acquired property to the extent of 80 per cent of its cost are deposited, provided this amount added to the funded debt and preferred stocks of subsidiaries does not exceed 80 per cent of the value of the assets, and if the consolidated income is 2 times the interest and 1½ times the interest and dividends on subsidiary securities which are not pledged. This issue is callable at 105 and down. The issue of collateral trust bonds in water and gas companies in New England is merely a remnant of former practice and would seem to have little to justify it.

Preferred Stock.—The preferred issue of the Federal Water Service Company may be taken as an illustration. This issue amounts to almost \$15,000,000, or more than twice the amount of the bonds now outstanding. Preferred stock has been issued in different series with identical provisions, except dividend preferences which range from 6 to 7 per cent. It is redeemable at 110 and votes only in case eight quarterly dividends are in arrears. The dividends on this stock have been earned several times over within the past few years.

Common Stock.—The common stock of this Company is classified into Class A and Class B. The former carries a cumulative dividend rate of \$2 and participates with the Class B stock equally upon any distribution on the latter. The two issues are of equal size. The Class A stock votes equally with the Class B stock in case arrears amount to four quarterly payments, at all times it is given a minority representation of three on the board of directors. Earnings on the Class A stock were \$4.50 in 1929 and \$3.46 in 1930.

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CHAPTER XXIII

ELECTRIC RAILWAYS

Early Street Railways.—The development of the street railway began in 1831 when the first horse-railroad, Stephenson's Bowery line with its "John Mason cars," was constructed on Fourth Avenue in New York City, already the metropolis of the country. The horse-railroad, however, did not come into general use until about 1850 but continued after that for a quarter of a century to be the only practical street conveyance for the masses of the people. The operating companies were small and restricted to small areas with the result that many franchises were granted within a given city, the companies in many cases competing with each other with the consequent loss of capital and revenue. Even in 1882 these companies employed 35,000 men, 18,000 cars, and 100,000 horses, representing invested capital of \$150,000,000. During this period the railways increased their traffic very rapidly, profits were great, and congestion on account of the smallness of the cars and the slowness of their speed brought the necessity for more adequate motive power and improved passenger accommodations.

Cable-cars were the result. They were first introduced in New York in 1869 and in San Francisco in 1873. They were expensive since they required better tracks for heavier cars, numerous cable and power stations, together with a complete conduit system. Cables wore out frequently, owing to the continued gripping and releasing of the car grips. The cable system was to a considerable extent installed in New York, Pittsburgh, Cincinnati, Washington, San Francisco, Denver, and Chicago. Already in the eighteen hundred eighties, however, the electric system was proving a success, and it was fortunate that the cable system had not more generally supplanted the horse-railroad, for the application of electricity as motive power rendered useless much of the invested capital in the cable system. The change was painful in those cities where the cable-cars had been installed and the companies had no way of amortizing the capital invested in the superseded system, it afterwards represented in the companies' accounts so much dead capital which was a burden to the new electric companies.

Early Electric Railways.—The basic inventions underlying the electric railway are the dynamo, effective transmission of current, and the motor for the conversion of electric energy into mechanical power. These fundamental inventions were available in a commercial way in the

eighteen hundred seventies. Much remained, however, by way of application and development of auxiliary equipment before the electric railway became an accomplished fact. To this task the electrical genius of America and Europe addressed itself during the decade of the eighteen eighties.

The initial experiment in electric railway was made by Thomas Davenport, a blacksmith of Brandon, Vt., in 1834-1835. He mounted a toy motor and primary battery on a small vehicle and was successful in operating it under its own power. About 1838 Jacobus and Davidson operated a 5-ton locomotive on the Edinburgh-Glasgow railway. The first use of rails to conduct current was contemplated in an English patent to Henry Pinkus in 1844, in the following year patents were also granted to Major Bassolo in France and Austria. But Prof. Moses G. Farmer in 1847 actually constructed a small car at Dover, N. H., and operated it by the use of rails as conductors. Within the next few years Hill and Page also operated similar cars in Boston and Washington, respectively. But all of these early experiments contemplated and used primary batteries for power.

The first exhibition of an electric railway using the dynamo for generating current was made at the Berlin exhibition of 1879, following the demonstration of the dynamo-electric machine by the Siemens firm. It operated on one-third of a mile of track and was composed of a locomotive and three cars capable of hauling 20 people. The current was supplied by means of a central rail, while the running rails were used for return current. The first regular line was installed at Lichterfelde in 1881.

About the same time Stephen D. Field and Thomas A. Edison were experimenting in America. A three-sided patent controversy arose among these two inventors and Siemens (all applications having been filed in 1880), with priority finally being awarded to Field, who filed a caveat already in 1879. It appeared that he had already projected an electric railway with current supplied from a stationary generator and the running rails to be used for return circuit. In 1880 Edison at Menlo Park operated a small electric locomotive with trailer, using dynamo for energy. Within the next few years experimental electric railways were improved and operated by F. J. Sprague, a midshipman in the United States navy, Charles J. Van Depoele, a Belgian sculptor residing in the United States, who was awarded the first patent (it appears largely on a technicality) for underrunning contact. Shortly afterwards, installation of similar systems was made in Great Britain. The Field and Edison interests were early combined and in 1883 they demonstrated a Weston machine at the Chicago Railway Exposition. During the next few years a great many experimental roads were operated in scattered sections of the country, most of them using the overhead trolley

As late as 1887 matters were still in the experimental stage. There were only 9 installations in Europe and 10 in the United States, with only 60 miles of track all told. There was no uniformity of practice and commercial success had not been attained. In the same year, however, three commercial contracts were consummated which contemplated installations in Richmond, Va., in St. Joseph, Mo. (both by Sprague), and one for the Observatory Railway of Allegheny City, Penn., by Bentley-Knight. The Richmond railway was placed in operation in 1888 and is now recognized as the first modern electric railway of size and the pioneer in the industry. Meanwhile, the Van Depoele interests had been absorbed by the Thompson-Houston interests whose main rival was the Sprague Electric Railway and Motor Company. Within the following 2 years there were over 200 railway contracts let. At this juncture the Edison General Electric Company appears to have assumed a leading role. In 1890 it absorbed the Sprague Company and some time later consolidated with the Thompson-Houston Company to form the General Electric Company. Soon the Westinghouse Electric Company entered the electric railway field also. Early electric railways met with opposition from the telephone companies whose operation was seriously interfered with by faulty pioneer methods of construction and control of electrical current.

Modern Development.—In 1888 there were only 150 miles of electric line in operation, while in 1890 the total street and electric railway mileage amounted to 5,783. From that time onward electric railways developed with marvelous rapidity. Never had a new invention found so fertile a field. Already in 1890 there were 25 cities in the United States with a population of 50,000 or more each. The great need of these cities was effective transportation, and the electric railway was the first real hope of meeting this need. With more effective transportation came also decentralization of population and the development of the suburbs. Street-car service thus naturally developed much faster than the growth of population.

With increased motive power larger cars were introduced with heavier and more expensive rails, necessitating the abandonment of the former equipment. Underground and overground equipment added further to the capital investment necessary. The growth of cities, too, made increased speed imperative, which in turn called for fenders, brakes, wheel guards, inclosed vestibules, and so forth. To these improvements must be added the large capital expenditure in power houses. Finally, when during the early nineties the superiority of the electric railway to the cable system was demonstrated, it became necessary for the cable companies to re-create their entire system. Thus in the transition from horse-cars to cable-cars and finally into electric railways, great amounts of capital have been commonly carried in balance sheets

of corporations and the securities which they formerly represented were never amortized

After 1890 the electric railway rapidly gained undisputed sway in the field of urban transportation. In 1890 approximately 70 per cent of all trackage was operated by animal power, while the remaining trackage was about evenly divided between cable and electric systems. In 1890 the South London line and in 1893 the Liverpool overhead railway were placed in operation. In 1895 the Metropolitan and West Side elevated roads were constructed in Chicago. Both used the electric motor for hauling cars. The following year the Nantasket Beach and the Lake Street Elevated were put into operation and soon service over the Brooklyn Bridge was begun. In 1895 Sprague invented the multiple-unit system for heavy transportation. It permits operation of any number of cars together and the utilization of high power with consequent great speed for elevated and interurban lines and subway trains. By 1902 the electric railway completely dominated the field, 97 per cent of all trackage being operated by electrical power.¹

The rapid increase in the growth of cities since 1900 and the resulting congestion of traffic necessitated the construction of a number of elevated and subway systems in addition to the surface lines. It also brought the tunnel, the double-deck cars, trains of cars, the express train, the third-rail system, the underground trolley, and a host of other improvements, always adding to the capital expenditure necessary. It increased the number of miles of all systems operated from less than 10,868 in 1890 to over 16,000 in 1902, and to 44,676 in 1917. New-track construction reached a peak in 1910 when 1,204 miles were constructed. Since then construction has faded away until in 1930 only 153 miles of new track were laid.

The War and After.—Up to the time of the war, street railways were numbered among the prosperous industries of the United States. Railway bonds and stocks of the larger systems were classed as investments of high quality. But with the war and coincident events the face of the picture changed completely. Never in the annals of business has an entire industry changed so completely in so short a time. It is true that the records show a considerable number of insolvencies in the years

¹ The development of private tramways in England was greatly retarded by the passage of the Tramways Act of 1870 which made property of tramway companies pass to the city at something like junk value after 21 years of operation. As the date of transfer approached, new expenditures became negligible while service deteriorated. Nor was the expenditure for electric railways feasible under the law, except in a few cases where charters had been extended. This situation led to development of interest in the municipal electric tramways and the fostering of paternalism in urban transportation. England fell behind the other countries in electric railway development as well as in electric lighting which was affected by a similar law passed in 1882.—A. G. WHITE, *The Electrical Industry*, Chap. II.

just prior to the outbreak of the war. In the period 1909 to 1914, inclusive, 116 receiverships occurred, involving \$159,105,000 of stock and \$214,245,000 bonds. But between 1915 and 1925, inclusive, 230 companies with almost 14,000 miles of track were placed in receivership. They had outstanding \$794,000,000 of bonds and \$569,000,000 of stock. The year 1919 alone saw 48 companies placed in receivership with 3,781 miles of track, \$312,900,000 of bonds, and \$221,200,000 of stock outstanding. In contrast with the failures prior to the war, these receiverships included some of the largest and most valuable properties in the United States. Within the recent past the street railway companies of all of the largest metropolitan districts of the United States have either been in receivership or have experienced financial distress. Almost all of the systems of New England in particular have been in a deplorable condition. Even the period 1924-1926 witnessed 42 receiverships with 3,509 miles of track, and over \$240,000,000 of stocks and bonds outstanding.

Within the past few years receiverships and defaults have receded somewhat but the record is still a dreary one. At the end of 1928 there were \$262,953,000 bonds in default, including \$146,000,000 of the Chicago Railways (defaulted only as to principal, however), many issues were for amounts from \$1,000,000 to \$7,000,000 and on widely scattered properties. All told there were 45 companies, with 3,585 miles, in receivership at the end of 1928 with over \$318,000,000 of stocks and bonds.¹

In 1929 there were five additional companies with 426 miles of line involving about \$75,000,000 of stocks and bonds placed in receiverships. The New York State Railways and the United Traction Company of Albany were prominent among these. The following year receiverships again appeared in large numbers and with large amounts of capital involved. Twelve companies with 1,431 miles of line, involving \$85,358,000 capital stock and \$108,372,000 of funded debt, went into receivership. The largest of these were the Chicago City Railways, Indianapolis Street Railway, Chicago City and Connecting Railways, and the Key Transit Company of Oakland, Calif. At the beginning of 1931 there were all told 83 bond issues in default, involving a total of \$258,053,790, of which the Chicago situation accounted for \$145,196,490 and the New York State Railways for \$26,000,000.²

Railways have been unable to engage in improvements on a large scale during the past decade. During the period 1919-1928 average annual new financing amounted to less than \$10,000,000. Expenditures on new plant and equipment have accordingly been confined largely to replacements and kept at a low figure. Track extensions since 1916 have averaged only about 250 miles per year with no established trend. This compares with an average of 1,064 for the years 1908-1911.

¹ Compilation by Dow, Jones and Company.

² *Electric Railway Journal*, January, 1931.

Causes of Receivership—The universal financial distress of electric railways led to the appointment of the Federal Electric Railway Commission, which reported in 1919. Although this report is not discriminating in many ways, yet it cites some of the contributing causes which in a large measure still apply to the finances of electric railways. It attributes failure to the following causes: (1) early mismanagement, (2) existing high price levels of labor and materials, (3) inadequacy of the 5-cent fare prescribed by statute or franchise. The commission recommended as remedial measures: economies in operation, improvement in tracks, equipment, and service, public cooperation to replace public antagonism, relief from special assessments for paving, sprinkling, and the like, regulation of jitneys and busses, arbitration of labor disputes, increase in fares, reduction of excessive capitalization, and state regulation of all except metropolitan districts where local regulation may suffice.

The Federal Commission did not give due emphasis to the underlying causes of electric railway troubles. These must always include failure of demand for railway service to fulfil expectations of the industry when many lines were extended into thinly settled regions at great cost, the 5-cent fare, and rising commodity prices and wages. An important factor in the situation has been attributed to the lack of enterprise of the management. Stunted by regulation and the 5-cent fare, managements lost all initiative and resourcefulness in a situation which required the highest talent to extricate the railways from their troubles.¹

Of the many economic changes brought on by the war, none is more fundamental for industry in general and for street railways in particular than the rise in the scale of wages. This rise was due to currency inflation and the relative improvement in the status of labor. While commodity prices and the cost of living in general had advanced prior to 1930 to something like 50 per cent over the 1914 level, the general wage scale showed an increase of approximately 100 per cent. In 1912 the wage bill of all street railways amounted to only \$174,000,000 while in 1922 it stood at \$388,000,000, but the number of employees rose only by an insignificant number. Richey's index of electric railway costs shows an advance of 131 per cent in wages and 36.9 per cent in construction costs in the period 1913-1930.

Fares.—The 5-cent fare is of antediluvian origin. It goes back to the horse-railroad and was transferred in turn to the cable and electric lines and became custom by common consent. Later when franchises were bargained between railway promoters and executives and city authorities, the 5-cent fare was included as a condition upon which the franchise was granted. Even as far back as the Civil War, Congress authorized increases in fares from 5 to 6 cents and most companies took

¹ A. S. DEWING, *Financial Policy of Corporations*, pp. 1092-1093.

advantage of this. But by 1884 on the eve of the development of the electric railway, fares in New York were back to the 5-cent basis. Even in Boston where zone fares had established rates as high as 20 cents for outlying zones, consolidation and electrification brought back the 5-cent fare. Expansion of street railways into outlying districts, thinly settled, accompanied by real-estate promotions, created the problem of the 5-cent fare. When industry is unfettered, it finds ways of adjusting itself even to such fundamental economic and currency revolutions as recently witnessed. But no industry was ever more completely shackled than the street railway industry, which had almost universally bound itself, hand and foot, in franchise agreements that called for a maximum fare of only 5 cents. That railway men were willing to thus bind themselves for the term of their franchise is testimony of their stupidity, but excusable in the light of the extreme optimism of the times and the once rampant prosperity (largely false) of the industry. That the public authorities clung with such a grip to the 5-cent fare, when it was plainly evident that such a fare was inadequate for the rendering of adequate service to the public, was equally stupid. Yet the letter of the contract was there and remained until the courts, interested in the prevention of confiscation of private property, intervened and canceled these hidebound contracts. Even in 1917 almost every company in the United States was charging only 5 cents for a ride. And as late as 1922 fares were about equally divided between 5, 6, 7, 8, and 10 cents. But the scene soon changed. Starting in 1919, the 10-cent fare gained rapidly until 1930 when more than one-half of the electrical railway companies were charging this amount. All other fares show decreases in the past decade. Today 7- and 8-cent fares hold second and third place. Less than 10 per cent of the companies are on a 5-cent basis.¹ But the 5-cent fare is still found on some of the large properties of the country, notably the New York traction system. Here a court in 1929 refused to overturn the letter of the franchise calling for a 5-cent fare.

Automotive Competition.—Coincident with the war and post-war period is the utilization on a grand scale of the automotive vehicle. The most important fact of this fundamental change in methods of transportation for street railways, is that, for the first time in the history of urban transportation, the street railways meet with serious competition. In 1912 there were less than 1,000,000 motor vehicles registered in the United States. As late as 1920 there were less than 10,000,000 passenger cars registered, but by the end of 1929 there were 23,121,589, almost one for about every five people in the United States, with the ownership strongly concentrated in the cities.

The competition of the motor vehicle has been in the form, first, of private ownership and friendly rides to the public and, second, in the

¹ *Electric Railway Journal*, January, 1931

form of the jitney and bus. The private automobile has undoubtedly created a revolution in transportation methods for its owner which will be permanent. The jitney threatened serious results and was actually calamitous to many street-car companies in the days before it was subject to control by the same authorities that regulated the street railway. But it has now passed as a factor in the situation and the bus has come to take its place. During 1929 there were 95,000 busses operated as public carriers by 23,000 companies, they carried 1,793,000,000 passengers or about 12 per cent as many as the street railways¹. In a number of cities of size, busses have entirely replaced electric railway service, as witness Danbury, Conn., Everett, Wash., Newburgh, N. Y., Patterson, N. J., while many smaller cities have witnessed the same change.

The experience of a street railway in the capital city of a Middle Western state is interesting in this connection. The population of the city and suburbs served by the traction company was about 75,000. Because it is the seat of the state university and other educational institutions, the city is widely known as the most desirable residence city of the state. The experience of the traction company from 1919 to 1923 was most discouraging to the management. Revenue passengers fell off steadily from 12,368,534 in 1919 to 7,267,962 in 1923, a loss of 41 per cent. With a single exception, the traffic during identical months of each of the five years showed a decrease from the preceding year. This result may be accounted for, first, from the fact that wealth is perhaps as evenly divided as in any other city of equal size in the United States, making the percentage of the population owning automobiles exceptionally high. The good-roads movement has encouraged driving. A second reason for the decline in traffic was the habit among automobile owners of picking up passengers waiting for street cars. The entire situation was aggravated by the fact that a small area near the center of the city includes the business district, the university, and the capitol. Since 1923 traffic has steadily declined, while many of the electric cars have been replaced by busses operated by the company.

The bus that is engaged in long-distance transportation is of little concern here. But the private urban bus operated in competition with the street railway, the successor to the jitney, has given street-car companies a great deal of concern. Busses are now made on a palatial design and have an appeal to the public never possessed by the jitney, whose appeal was solely the 5-cent fare and optional destination on the part of the patron. The railways, however, have not stood by and left the field of the bus to outside interests. On the contrary, the companies have attacked the economic problem involved and have to a large extent already utilized them where they have proved advantageous. This development has come almost entirely since 1922 and particularly since

¹ *Commerce Yearbook*, 1930, p. 589

1925 when busses were being used as feeders of the main street-car lines. They were later extended into territory of sparse settlement, the new suburbs of the metropolitan districts in particular, at the beginning of 1931 over 13,500 busses were operated by upwards of 1,350 street railway companies.

It must not be concluded, however, that the bus as employed by street railway companies has thus far proved a source of profit. Rather, the bus has proved to be a feeder and is in general service in sparsely settled territory, but in most of these instances operation is still at a deficit. The most important accomplishment of the bus is in saving costs and avoiding the competition of outside companies. This latter, however, in the long run would probably not be serious, for the reason that under present conditions the bus is regulated and the unfair competition which prevailed with the jitney is mostly absent. Experience has shown that almost everywhere the urban bus operates at a loss when adequate accounting methods are employed. Competition under these conditions must be short-lived at the best. In a report of the American Electric Railway Association¹ it was shown that only about 13 per cent of the bus lines operated by the companies were profitable, a large majority of the lines being unable to show profits before depreciation and taxes. The street car still reigns supreme in the thickly settled and congested districts of cities, in spite of the traffic jams occasioned by the automobile with the resultant deterioration of the service. With the supplementary service of the bus, street railway companies have been enabled to hold their own in passenger traffic since the war, although car passengers have gradually fallen off since the peak year of 1923. Altogether, passenger rides have failed to keep pace with the growing population of cities and the signs of the times are still adverse to street railways as a whole. The extension of rapid-transit lines in some of the large cities has proved helpful in maintaining the traffic on surface cars.

In addition to busses operated by the railways, more recently taxicabs have been used as auxiliary service. Some companies operate their own taxicabs, while others have entered into affiliation with taxicab companies. Taxicab service has been inaugurated in Philadelphia, Kansas City, Cincinnati, Grand Rapids, and Tacoma.²

Other Difficulties.—The Committee on Public Service Securities of the Investment Bankers Association summarized the difficulties of the street railway in its report for 1928 as follows:

It has faced an unprecedented accumulation of misfortunes since 1920. The rapid growth in the use of the automobile beginning after that year, and becoming greater each year, took away millions of passengers. Resulting traffic congestion tied up the cars in the streets, demoralized their schedules and made

¹ *Bulletin* 87, 1926, p. 4

² *Electric Railway Journal*, January, 1931

efficient service impossible. The street car companies bore the brunt of all the public criticism. Operating costs, of which platform wages represent the greatest part, jumped nearly 200 per cent since 1914. Fares went up little more than 50 per cent. The 5-cent fare, all but written into the Constitution, was hard to get away from. Thus, with expenses increased, service impaired, the rubber-tired competition of individual transportation steadily growing fiercer and the way to more revenue blocked by the low-fare fetish and Public Service Commissions, street railways were having a struggle for existence.

In 1930 the same committee reported that the industry continues to suffer, even though slight improvements in reducing costs were discernible. It pointed out further that.

Fallacies of principles and ideas accepted by the industry years ago, and unrecognized as such because hidden by the gracious years of non-competition and abundant income are now at the surface for what they are, like rocks at low tide. The whole industry needs a new appraisal and a public recognition of the social importance and the equities of the transportation problems. Unless there develops a public recognition that the time has come for it to bear its appropriate share of the costs involved in the creation of high grade transit facilities, it is difficult to see how electric railway securities as a class can recover the ranking to which they are entitled, how refunding can be handled, how new money can be raised in the quantities required. The troubles are deep-seated and fundamental and must have active public recognition if transportation securities as a class are again to be recognized as having investment worth.

Street Railway Franchises.—The franchise is more important to the street railway than to any other class of utilities, since street cars must use the streets for their tracks and service. This involves questions of taxation, paving between the tracks, repairing the same, shoveling of snow from the tracks in winter, sprinkling, conditions upon which transfers are given, and the question of rates.

Perhaps the most important caution here is the fact that many street railway bonds mature either at the time or after the franchise expires. On account of failure to renew franchise in time, the Chicago City Railways today is in default on its funded debt and the road has been placed in receivership. The case is more elusive and complicated when the holding company organization issues its own bonds which mature at the time or after the franchises of important subsidiaries expire. The United Railways of St. Louis, now in the hands of the receiver, is a case in point. Here all efforts to come to agreement and renew the franchise failed. Although ultimate solution will undoubtedly be found for these difficulties, confidence has been destroyed and the price of the bonds and stocks of the companies concerned suffers, while the customary market is lost.

Recent Progress.—Some progress may be noted in certain street railway situations despite the generally gloomy outlook. First may be

mentioned the tendency toward consolidation with its saving in costs. The number of operating companies decreased from 943 in 1917 to 682 in 1927. Many unprofitable lines have been abandoned, the total mileage decreasing from 44,835 in 1917 to 39,475 in 1929. Passenger cars decreased from 79,914 in 1917 to 67,489 in 1929. In the latter year alone about 2,300 cars, a record number, were scrapped.¹ Newer equipment is of better design and of less dead weight. The number of passengers carried showed steady increase till 1920 when the number reached 15,541,000,000. After 1920 a steady decline set in which reduced the number to 14,435,000,000 in 1929.

An industry that develops as rapidly as the street railway business did, must of necessity have made many mistakes and left in its wake an undesirable heritage for the future. The street railway was specially confronted with problems that arose in the course of its evolution. Too rapid development led to unprofitable extensions into undeveloped territory and to needless parallel lines of competing companies. Many companies have been busy putting their financial houses in order. In many cases the receiverships have eliminated excessive debts, while operating efficiency has steadily improved. There has been relatively little spent on new equipment and attention has been directed toward rendering a higher class of service and cultivating more friendly relations between the companies and the public. The solution of the cost problem may safely be left to the executives in charge of the properties and, if the uncertainty surrounding the position of the railways themselves were removed, the optimism of the men in the industry would find greater justification.² But even with the declining tendency of profitable traffic, the disposition to increase the fare to 10 cents will go a long way toward solving the problems of the street railways. However, it cannot be said that the future of the industry is bright as long as fundamental conditions are unfavorable.

Traffic Density—In electric railways measures of traffic density are important and may be calculated according to number of revenue passengers per mile of line, or per capita rides per year. Since 1902 traffic density has increased steadily in the United States. The number of passengers per mile of line increased from 212,187 in 1902 to 252,336 in 1917, and to 299,130 in 1927. The increase in the former period was accomplished in the face of increase in mileage, but in the latter period a decrease of approximately one-tenth in mileage accounts for the continued improvement. This result for the latter period is due to the gains in the larger cities. Traffic density of 96 city companies in 1925 amounted to 516,238, of 48 interurban companies, only 18,695.³ In 1930 the figures stood at 423,159 and 22,056, respectively.⁴ Elevated and subway lines

¹ *Commerce Yearbook*, 1930, pp. 587-588

² *Electric Railway Journal*, May, 1926

³ *Ibid.*, June, 1931

show a much lighter traffic density and a rapid uninterrupted increase since 1907. In that year it was 1,513,459, in 1917 it had increased to 1,895,660, and in 1927 it was 2,552,637.

Accounting.—Scientific accounting for street railways dates from 1914, when the Interstate Commerce Commission prescribed a system of accounts for this class of public utilities. It has since been modified and adopted by state commissions, so that at the present time the annual financial results are comparable and make it possible to get a picture of the trends in operation for the industry as a whole. Individual companies, however, differ widely and the comparative method of analysis is subject to greater limitation in street railways than in most other public utilities. This is due to variations in size of the city, climate, topography, and so on.

Operating Revenues.—Prior to 1922, operating revenues of electric railways showed a strong upward trend with cyclical influences scarcely noticeable. But after 1922, a distinct slowing down occurs, although revenues continued to increase till 1930 and 1931, when a large slump was experienced. Doubtless the increase in fares since the war has offset the drop in traffic previously noticed. Likewise, the net income from 1922–1929 showed steady improvement, reversing the trend of previous years. This is in part the result of the per capita increase in revenue passengers down to 1920, since which time the trend has been reversed. While almost all operating revenue is derived from passengers in city railways, interurban lines (as shown by 40 companies) derive 64 per cent from passengers, 32 per cent from freight, and 4 per cent from express.

Operating Expenses.—Operating expenses for 112 city and 40 interurban electric railways may be viewed from the following data collected by the *Electric Railway Journal*.¹

TABLE 46—OPERATING EXPENSES OF ELECTRIC RAILWAYS, 1930

Expenses	112 city companies	40 interurban railways
Way and structures	9 4	14 9
Equipment	9 4	8 1
Power	13 0	13 1
Conducting transportation	46 5	34 9
General and miscellaneous	15 5	25 3
Depreciation	6 2	3 7
Total	100 0	100 0

As might be expected, interurban lines with their greater mileage and thinner traffic show a greater percentage of total expenses in maintenance.

¹ Annual Statistical Number, January, 1931.

of way and structure and equipment than city lines. General expenses, too, are larger, since overhead would be larger with thinner traffic. On the other hand, greater personnel in city railways swells the item of expenses for conducting transportation. More intensive capital expenditures for city railways lead to higher depreciation charges. In their effort to control expenses during the 1930 depression, 201 electric railways reduced operating expenses 6.80 per cent. This was accomplished by reducing maintenance expenses by 8.40 per cent, expenses of conducting transportation 7.14 per cent, while expenses for power and traffic, general, and miscellaneous items were reduced less than the average.¹ As in the case of steam railways, saving on maintenance is partly postponed expenses which must be made up later. Viewed from another angle, revenues of 1930 were accounted for as follows:

	Per Cent		Per Cent
Taxes	24.4	Wages	38.8
Net income	4.6	Other operating expenses	32.7

See *Electric Railway Journal*, January, 1931

Wages are by far the most important item in the list of expenses. They show a rapid rise until 1922 and were at a peak in 1926, after which they show some decline. Nevertheless, the index for electric railway wages, after rising from 100 per cent in 1913 to 222.7 per cent in 1921, continued its advance through 1930 when it reached 231.²

Taxes.—The tendency for taxes to rise is observable in electric railways the same as in other classes of utilities. In 1907 taxes amounted to 4.7 per cent of operating revenues. They rose gradually to 6.3 per cent in 1922 and have remained fairly constant since then. In 1927 they absorbed 25 per cent of net operating revenues. In elevated and subway lines, they increased 28 per cent in the period 1922–1927, while operating revenues increased only 23 per cent. In 1927 taxes exceeded dividends by 32 per cent. Taxes are mostly state and local, since there has been little net revenue to tax since 1920 under the federal income tax.

Operating Ratio.—For a decade prior to the war the operating ratio of electric railways averaged just under 60 per cent. The rising costs during and after the war, unaccompanied by adequate increases in fares, caused this ratio to advance steadily, until in 1927 it amounted to 74.9 per cent.³ Some improvement has appeared within the past few years but in 1930 it again rose to 74.7 per cent.⁴ City railways make a decidedly better showing than interurbans. In 1929 the former showed 67.62 per cent

¹ *Electric Railway Journal*, June, 1931

² *Ibid.*, Annual Statistical Number, January, 1931

³ *Census Report on Electric Railways, 1927*

⁴ This calculation is based on 282 companies reporting to the *Electric Railway Journal* (see June, 1931, number).

and the latter 78.95 per cent which figures rose to 69.12 and 86.81 per cent, respectively, in 1930.¹

Operating Income.—Operating income showed constant increase down to 1922 but fell sharply afterwards. As reported by the Census Bureau, operating income of electric railways was as follows.

TABLE 47—OPERATING INCOME OF ELECTRIC RAILWAYS

Year	Operating income, thousands	Value of road and equipment
1907	\$147,123	\$3,637,000,000
1912	199,587	4,596,000,000
1917	211,474	5,136,000,000
1922	224,136	5,058,000,000
1927	175,505	(not available)

Census Bureau, *Electric Railways*

Seasonal Fluctuations.—More than this, there has developed within the past decade a tendency for the receipts to fluctuate more broadly from month to month throughout the year. This means that in the future a larger plant will be necessary to take care of peak-load traffic than has been the case in the past. Moreover, the months of maximum traffic for companies located in the northern half of the United States now come in the cold season, reaching the peak in December, with the minimum in the warm season, the low point being in August. This situation is the reverse of the pre-war conditions and is doubtless created by the automobile, whose popularity has a tendency to wane in the winter months when motors are disposed to stall and riding is not so comfortable. On the Pacific Coast and in the South, revenues are more uniformly distributed throughout the year. Seasonal variations in traffic are significant for street railway companies because the months of greatest traffic are also the months of high operating expenses. It is noteworthy also that within recent years, while Saturday traffic is still the heaviest, it has fallen off abruptly and Sunday traffic has further decreased.

Cyclical Fluctuations.—Street railway traffic has always shown a tendency to fluctuate with the business cycle. In the period of rapid growth this fluctuation was much like that of power companies today, in that the trough of revenues of each succeeding year of depression was higher than that before. But at the present time these fluctuations in revenues resemble fluctuations in the revenues of manufacturing concerns, although milder in character.

The severe business depression of 1930-1932 was reflected in traffic and revenues. In 1930 operating revenues of 282 electric railway companies in the United States dropped 8.26 per cent from the 1929 level, and passenger traffic 8.43 per cent. Interurban revenues dropped more

¹ *Electric Railway Journal*, June, 1930.

severely than the revenues of city companies, the former falling off 13.93 per cent and the latter 8.19 per cent. These declines are due chiefly to traffic decline, which dropped 11.25 per cent for 201 companies in 1930.¹ Declining revenues continued during 1931. During the first 5 months of 1931 leading companies showed the following results:

TABLE 48—INCOME AND EXPENSES OF ELECTRIC RAILWAY COMPANIES, FIRST 5 MONTHS OF 1931

Companies	Operating revenue, per cent decrease from 1930	Operating expense (including taxes), per cent decrease from 1930	Net income, per cent decrease from 1930
Boston Elevated	7.95	5.73	34.86
Brooklyn-Manhattan Transit	3.54	4.84	2.84
Chicago Surface System Lines	8.35	4.32	15.60
Department of Street Railways (Detroit)	22.52	19.68	68.30
Interborough Rapid Transit Co.	8.35	4.87	27.27
Market Street Railway	6.87	7.02	5.04

Electric Railway Journal

Industrial centers like Detroit and Chicago are more severely affected than other localities. The slump in the motor industry gives great concern to the Detroit city management. The decline in revenues was accompanied by a decline, but of a lesser amount, in operating expenses. Against the decline in 1930 from 1929 of 8.26 per cent in revenues for 282 companies, there was a decline of 5.39 per cent in operating expenses and of 15.80 per cent in net operating income. While some companies show ability to reduce operating expenses even more than operating revenues, the result is customarily the reverse, as shown in the above table with the even more severe decline in net income. The reduction of net income in Boston and Detroit resembles the situation in railroads and presents problems as severe. The interurban companies make the poorest showing. Against the drop in 1930 from 1929 of 13.93 per cent in operating revenues, there is a decline of only 5.37 per cent in operation expenses and 25.69 per cent in operating income. In 201 companies net income after depreciation dropped 97.52 per cent in 1930, as compared with 1929.²

Electric Railway Finances.—In its financial methods the street railway industry has repeated in its essential parts the experience of steam railroads. The smaller properties from the first followed simple methods of finance. They were capitalized either entirely by stock issues or more

¹ *Electric Railway Journal*, June, 1931.

² *Idem*.

often by large first-mortgage bond issues with stock thrown in. Out of the period of competition in the larger metropolitan areas came the consolidation of properties and, with it, complications in finance. The first mortgages of the underlying lines were allowed to remain as subsidiary obligations, while junior mortgage bonds of some description, such as general mortgages, second mortgages, refunding issues, and debentures, were added. Preferred stocks were sometimes found also as a result of consolidation, but these originated mostly, as in railroad finance, through reorganization. Common stocks were found in quantity also but seldom represented any tangible investment. Even with the comparatively small equity in investment represented by the stocks of railway companies, the bonds generally exceeded the combined amount of preferred and common stock. Overcapitalization is also evidenced by defaulted bonds and receiverships already cited. It is further shown by the fact that, even in 1912, 34 per cent of the preferred and 49 per cent of the common stocks were paying no dividends.

Electric Railway Securities in Receivership.—In the numerous receiverships and reorganizations which have been the lot of street railway companies, the common and preferred stocks frequently were eliminated entirely. In most of the remaining cases they were so reduced in status that there was little of value left for the holders. The preferred stockholders frequently assumed new common stock in the reorganized company with the controlling interest, while the common stockholder, when he received anything at all, had to be content with a minor share in the new company. The first-mortgage bondholders were usually left undisturbed if the properties back of their bonds represented real value, but frequently sacrifices were required. In a few cases total extinguishment resulted, while, in others, concessions at some points were demanded, such as reduction in principal or interest or security with apparent compensation at other points. The junior bondholders suffered more than the first-mortgage holders. Their status was one that differed, mostly in degree only, from that of first-mortgage bondholders and the sacrifices required were of the same type. In both cases it was rather common to require them to accept adjustment mortgage bonds and preferred stocks in exchange for the larger portion of their bonds. On the average the net effect of the reorganization on capitalization was to reduce the interest charge on bonds by about 30 per cent, to greatly increase the preferred stock, and to cut down the common to about two-thirds of its former amount, leaving the reorganized corporation with about 80 per cent of the former capitalization.¹

Capitalization.—Figures for capitalization of electric railways for 1922 reveal a heavy burden of funded indebtedness. In addition to this, floating debts amounted to \$176,000,000.

¹ DEWING, *Financial Policy*, pp. 1094-1101.

TABLE 49—CAPITALIZATION OF ELECTRIC RAILWAYS, 1922

Companies	Amount (000,000 omitted)	Percentage of total
All companies		
Common	\$1,842	34
Preferred	486	9
Funded debt	3,103	57
Total	5,431	100
Operating companies		
Common	1,521	32
Preferred	450	10
Funded debt	2,748	58
Total	4,719	100

Census of Electric Railways, 1922

Electric Railway Bonds—The traditional limited closed first-mortgage bond with the after-acquired property clause and sinking fund is still found in large numbers in electric railway financial structures. In many cases it rests on valuable property and is in a strong position, but frequently the older issues have only a small equity of real value and represent overcapitalization and padded construction accounts. The above type of bond, within the past decade, has frequently been replaced by the open-end refunding mortgage, covering all of the property of the corporation and restricting future issues somewhere between 70 and 80 per cent of the construction cost of the new property, and total interest requirements within the $1\frac{1}{2}$ to 2 times earnings ratio. As already explained, bonds of this type are large issues, they are more easily listed, nearly always command a better market, and are in many ways more desirable to the investor.

The prices of bonds of street railways have failed to advance in proportion to railroad bonds. They advanced only about 10 per cent on the average from 1923 to 1927 while railroad bonds rose 20 per cent.¹ In 1929 two issues of long-term bonds were floated at prices and coupon rates to net 8.35 and 8.36 per cent.

Notes.—The low state of electric railway credit even in 1929, a year of prosperity, is shown by the fact that \$18,310,000 represented the total financing for new money. All but \$2,500,000 of this represented short-term notes which were issued to yield from 6.84 to 7.06 per cent.² The increase in short-term financing in 1929 was particularly unfortunate in view of the low depression years following.

¹ *Analyst*, Feb. 10, 1928.² *Report of the Public Service Securities Committee of the I. B. A. of A.*, 1930.

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CHAPTER XXIV

THE TELEGRAPH

Communication by Signal.—The problem of communication at a distance occupied the attention of people even in ancient times. This became an imperative necessity in the case of defense against the enemies of the community. Many of the legendary heroes of the literature of antiquity were the light-footed dispatchers of messages to their superiors. Where distances were long, relaying was employed to avoid delay. The Chinese sent messages in this manner over 1,000 years ago. So Montezuma, greatest of the Aztec kings, 400 years ago erected post houses or stations for relaying messages when quick communication was desired. He is said to have procured his fresh fish in this way. But this method was uncertain and too slow even at its best. The employment of bonfires and signal lights by night and columns of smoke by day became common methods of warning the community of the approach of an enemy. Elaborate flag signals were employed by the Greeks.

In the Middle Ages flags, banners, and lanterns were used in military maneuvers. Later when cannons were invented, another important means was added. Maritime signaling was accomplished upon the introduction of the square rig by letting a sail fall a certain number of times. Most signaling depended upon the position in which the flags or lights were displayed. The first attempt at a regular code is said to have been made by James II, but all such methods were very defective until late in the eighteenth century when Admiral Kempenfelt devised the plan of combining flags in pairs. Toward the close of the eighteenth century, too, Claude Chappe used a device similar to the semaphore (still used in railroad communication) with blades which could be set in a variety of ways so as to form crude letters and characters. These placed on hilltops or ships were used to flash messages for miles. It is said news of the progress of the battle of Waterloo was thus flashed across the English Channel to Dover and London. News of the opening of the Erie Canal in 1825 was communicated in several minutes time from Buffalo to Albany by means of cannons placed 6 miles apart. Considerable progress was made in signaling in 1867 when the British navy adopted the flash system of signaling developed by Captain Philip Colomb. But no great progress in distant communication was made prior to the utilization of electricity for this purpose.

The Electric Telegraph—The electric telegraph of today has been made possible through the ability to transmit electrical impulses over long

distances In turn, the transmission of electrical force is the result of many varied and long experiments In the beginning transmission of impulses was accomplished through magnetism Even in the twelfth century B C, Homer notes the magnetic attraction of the loadstone, while also observing the same property in rubbed amber But no attempt was made to explain magnetism until the time of Roger Bacon, who in 1267 published his theories of polar attraction of the loadstone Following this, the sympathetic telegraph attracted attention In 1558 Porta described this as consisting of two magnetized needle-shaped pieces of steel, each suspended in the center of a lettered dial Both needles having been magnetized by the same loadstone, movements of one found sympathetic response in the other Thus by spelling out words on the dial an attempt was made to establish long-distance communication Numerous experiments with the conductivity of various materials by Gilbert, Cateo, Guericke, Newton, Gray, Wheeler, and others followed these efforts But no practical results were achieved until the principle of the Leyden jar was discovered in 1745 This device was the first of the condensers from which the modern storage battery was developed In 1746 Watson, utilizing this device, succeeded in sending a charge of electricity through a wire a distance of 10,600 feet, using the earth to close the circuit In 1753 the first practical suggestion for a telegraph was made by an anonymous writer to *Scots Magazine* He suggested the use of an insulated wire for each letter of the alphabet with a light ball attached at the receiving end which could be made to attract bits of paper bearing letters of the alphabet This idea was apparently not carried out until 21 years later by Le Sage in Geneva In 1787 Lomond devised an alphabet of motions employing but a single wire, the circuit being closed by a return wire

Experimentation with "pithball telegraphs" was followed by "spark telegraphs" which delivered signals by means of sparks produced at the terminals of wires by breaking the circuits Letters were cut out of tin-foil strips and arranged in a row on a glass table with terminals beneath They became visible when the circuit was broken Thus Reizen in 1794 and others were experimenting with signals, while Galvani accidentally discovered in 1786 that a continuous current could be produced by bringing two kinds of metals into contact with animal tissue In 1800 Volta advanced the principle still further by constructing the voltaic pile In the same year Salva applied voltaic currents to transmit signals

Following these discoveries came the electrolytic telegraph which was based upon the discovery in 1801 by Nicholson and Carlisle that the introduction of an electrical current caused the decomposition of liquids into their different elements In 1805 Salva constructed a signaling system based on this principle Bubbles of hydrogen appeared at the receiving end of the circuit The letters and numerals were represented

by so many circuits terminating in a vessel of water. Messages were read by observing bubbles of gas at the respective terminals. A number of variations of this method of transmission appeared in the first part of the nineteenth century.

With the invention of the electromagnet in 1825 by Sturgeon, following experiments of Oersted and others, a new note was struck in the development of the telegraph. The electromagnet consisted of soft iron in horseshoe form with a wire coiled around the prongs. When an electric current was passed through the wire, the iron would attract an armature of soft iron. Henry increased its strength by increasing the number of wires coiled about the horseshoe. In 1831 he constructed a signaling apparatus by suspending a magnetized steel bar between the two arms of the horseshoe magnet. Upon the passage of a current through the wire, the north pole of the steel bar was deflected toward one arm of the magnet, the south pole striking a bell. By the sound of the bell a code was arranged so that communication could easily be established.

In the meantime the discovery was made by Oersted in 1819, that a current passing through a wire adjacent to a magnetic needle, caused a deflection in the position of the needle. At the suggestion of Laplace, Ampere in 1820 used the principle in signaling over wires each of which represented a letter of the alphabet. During the following 20 years the electromagnetic-needle telegraph was attracting wide attention. The names of Gauss, Weber, Cooke, Wheatstone, and the Highton brothers are connected with the development of the telegraphy. These men spent their time in working out sets of signals which could be used to communicate over a small number of wires. Finally the single-needle instrument which carried an indicator pointing to separate letters according to the deflection of the needle was devised.

Morse's Telegraph.—But all of these needle telegraphs were slow and cumbersome. It remained for Samuel F. B. Morse to invent the modern electromagnetic recording telegraph. The idea was conceived on board the packet-ship *Sully* in 1832 on its way from England to America. In the course of conversation with Dr. Watson, of Boston, the latter referred to Faraday's publication in 1831 dealing with magneto-electric induction, by which a current could be induced by passing a magnet through a helix of wire forming part of a closed circuit, thus enabling an instantaneous and continuous passage of a charge of electricity along a wire. Morse at once conceived the idea that by opening and closing the circuit signals could be recorded. He likewise conceived the dot-dash-space code which has since become almost universal.

During the course of the next few years, Morse labored at perfecting these ideas, receiving financial support from Vail. Together Morse and Vail developed the relay which enables currents to be transmitted almost any distance, the key for sending messages, and the sounder which

replaced the recorder. In 1838 Morse applied for a patent which, however, was not granted till 1848. In the same year he demonstrated the telegraph before President Van Buren and his cabinet, whereupon Congress appropriated \$30,000 to demonstrate the practicability of the invention. An experimental line was constructed between Washington and Baltimore in 1839, a distance of 40 miles. It was partly laid underground in lead pipes but mostly attached to unbarked poles along the fence of the Baltimore and Ohio's right of way, and it connected the passenger stations in Baltimore with the Supreme Court room in Washington. The first words transmitted, "What hath God wrought" were immediately followed by business, political, and news messages.

Although the experiment was regarded as a success from the start, the government refused to accept Morse's figure of \$100,000 for the invention, because it was "uncertain that the revenues could be made equal to the expenditures." The telegraph was extended to Jersey City in 1846, to Cincinnati in 1847, and to New York and Boston in 1848. In 1861 the continent had been spanned, the connecting link from San Francisco to New York being forged at Salt Lake City. The political necessity of the telegraph was recognized by Congress which voted an annual subsidy of \$40,000 for 10 years to the system. It superseded the pony express which operated only 16 months and required 12 days from Saint Joseph to Sacramento. The telegraph thus was the effective means of communication that bound the Pacific coast to the rest of the union. Sibley was the chief promoter and his ambition was almost incredible for the time, it illustrates the lifting of the mental horizon of the world through instantaneous communication. He planned a telegraph from San Francisco to Paris going via Bering Strait and cable to Siberia, Moscow, and St. Petersburg. Seven hundred miles were actually constructed in British Columbia and Alaska. But the development of the cable soon made transoceanic communication more promising and the scheme was abandoned.

Commercial Development—In 1844 Morse organized a private company to construct a telegraph line from New York City to Washington. By 1851 there were 50 companies in operation in the United States employing Morse patents, which were extended to Europe in the following decade. But many conflicting devices competed for supremacy in the early stages of the commercialization of the new principle. Among these, Wheatstone's automatic transmitter pressed its claims the hardest. This consisted of perforations of a tape by hand punches which could then be run through the transmitter at high speed and simultaneously recorded ink impressions on a tape at the receiving end of the line. But the apparent advantages of this instrument were not realized in practice and the telegraph remained a Morse invention. More effective commercial opposition came from another source. Royal E. House, of Vermont,

invented the printing telegraph which was first used between New York and Boston, and New York and Philadelphia. It is still the most widely used in Europe. Judge Samuel L. Selden of Rochester, N. Y., and with headquarters there, promoted the House system from New York to Albany and Buffalo on the New York Central Railroad. This became the nucleus of the future Western Union System. Selden and Hiram Sibley projected a line to St. Louis but on account of lack of capital it reached only as far as Louisville with a branch to Chicago.

In this early era of telegraph promotion, capital was hard to interest in the enterprises projected on every side. Competition and too rapid extension in a fertile field soon spelled ruin to most of the companies. But Selden's company weathered the financial storms and acquired the bankrupt companies at distress prices. In this process it acquired the Morse patents and formed the Western Union Company. The House system was always breaking down and was very expensive. The Morse System, on the other hand, was dependable and economical. The Morse interests soon controlled the telegraph systems covering the states north of the Ohio River, Minnesota, Nebraska, Missouri, and Kansas. Although there were five other companies of considerable size, the Western Union was far in the lead of them all.

The pioneer period in the development of the American telegraph system may be said to have closed in 1856, when the Western Union Telegraph Company was formed out of the consolidation of a large part of the systems of the country. Further consolidation of independent companies continued, culminating in 1887 with the absorption of the Baltimore and Ohio Telegraph Company, the last of the powerful rivals of the Western Union Company. By 1888 the two telegraph systems of today, the Western Union and the Postal System, had emerged from the period of competition and confusion. By 1893 the Western Union Company alone had 189,936 miles of pole line and 769,201 miles of single wire, while the number of offices increased from 2,565 in 1867 to 21,078 in 1893, and the number of messages sent from 5,819,000 to 66,591,000. Prior to consolidation of competing companies, it was necessary to relay long-distance messages at terminal points, employing two or more companies in the transmission of a single message.

Telegraph rates showed a steady reduction from 1866 onward. With the consolidation of competing companies, expenses and rates were greatly reduced. Rates in and around New York were reduced some 20 per cent, while in the West and South the reductions were much greater.¹ The average toll per message decreased from 69.5 cents in

¹ For instance, rates from New York to Cleveland were reduced from 1866 to 1900 from \$1.45 per 10 words to 40 cents; to Chicago from \$2.05 to 40 cents, to Omaha from \$4.45 to 50 cents, to Denver from \$7.00 to 75 cents, to San Francisco from \$7.40 to \$1.00; to the Pacific Northwest from an average of \$11.00 to \$1.00.

1871 to 32 1 cents in 1885 and remained about the same for 20 years thereafter. Already in 1888 the Western Union and Postal Systems had reached an understanding as to rates and by 1900 uniform rates became the rule ¹. In 1920 a 20 per cent increase in domestic rates was granted by the government. This applied to all interstate and by agreement with state authorities, to 96 per cent of intrastate business. The federal government has enjoyed preferential rates for its messages sent by Western Union service since 1866. The company assented to the provision in the Post Roads Act of that year which gave control of rates on domestic government business to the postmaster general. From 1893 to 1920, government rates were only 41 per cent of rates for ordinary commercial business. In 1920 the government fixed its rate at 40 per cent of the commercial rate.

The period of consolidation and rapid development was accompanied by extraordinary financial success to the Western Union Company. It led to reckless stockwatering through consolidation and stock dividends. The capitalization of this company in 1858 was only \$385,700. This increased to \$22,000,000 in 1866, of which \$18,000,000 was the result of stock dividends. In 1900 the total capitalization including bonds stood at \$131,364,665. The property itself was largely built out of earnings, while stockholders were paid fabulous dividends. Testimony is to the effect that an investment of \$1,000 in the stock in 1858 would have returned to the stockholders by 1890 \$50,000 in stock dividends. In 1874 a cash dividend of 414 per cent was declared, while in other years 100 per cent plus stock dividends was paid. However, the exorbitant profits were reduced as rates were decreased, and from 1885 down to 1912 expenses increased more rapidly than receipts, with the result that total profits averaged no more at the end of the period than they did in the early eighteen hundred eighties, while the operating ratio gradually increased.

Pre-war Stagnation.—After the feverish period of development before 1900, the telegraph industry reached a period of stagnation which persisted down to the time of the war. There was almost no expansion in miles of pole line and only a moderate increase in miles of single wire, while the utilization of the telegraph by the public was only a matter of growth of the country and population. The industry had arrived at maturity and with it came the usual experience of resting on the glory and prosperity of the period of growth. In the decade 1902-1912 the number of messages sent by telegram increased only 20 per cent, miles of pole line 4 per cent, miles of single wire 38 per cent, value of plant and equipment 38 per cent, number of offices 13 per cent, gross income 35 per cent, net income dropped 36 per cent, while the number of employees increased 70 per cent, and expenses 93 per cent. Statistics of Western

¹ *Report of the Industrial Commission*, Vol IX p 195.

Union alone show a rise of 90 per cent in gross income from 1900 to 1913, but there was an increase of 139 per cent in expenses and a drop of 35 per cent in net income. Dividends were at times drawn from surplus.

The War and After.—The war aroused the telegraph industry from the lethargy of the preceding period and it entered upon a period of intensified utilization of plant and greatly increased prosperity. The number of land and ocean cable messages jumped from 109,000,000 in 1912 to 158,000,000 in 1917 and advanced further to 229,000,000 in 1927. In the 15-year interval from 1912 to 1927 revenues from telegraph traffic increased from \$60,403,000 to \$177,589,000. Expenses increased less rapidly, with the result that net income advanced from \$6,383,000 to \$23,844,000, and dividends from \$6,180,000 to \$14,199,000.¹ The intensification in the use of telegraphic service has been accomplished through an increase of 4 per cent in miles of pole line, 18 per cent in miles of single wire, and an actual reduction in the number of offices of 10 per cent. The number of employees, however, increased 120 per cent and wages and salaries 300 per cent. Progress during the decade following the World War was especially marked. This was due to a combination of factors seldom found operative at the same time. First, the extraordinary stimulation of research in the field of scientific knowledge in general and especially in the field of electricity with an unusual number of inventions of significance for the telegraph. The second basic factor has been the extraordinary prosperity of American enterprise in general following the war. All forms of communication participated in the upswing in general business. Lastly must be mentioned the reawakening of the men responsible for the progress of the commercial telegraph itself. Underlying this awakening has been the stimulus of the newer forms of competition in the field of communication, namely, the wireless, the radio, and the long-distance telephone.

Back of it all is the new vision of world affairs that has dawned upon American business men as a result of the new position of the United States in world affairs. Nothing is more vital in knitting the world together than communication systems. Through consolidation, interconnection, and cooperation men have linked the telephone, telegraph, cable, and radio into far-flung systems of communication reaching every corner of the globe.

The main interest here centers in the development of telegraphy in the United States since the war. It is from this shore that world communication has proceeded in this remarkable period. The United States stands at the head of all countries in the development of the telegraph. Comparative statistics of telegraphy of the leading countries of the world for 1929 are interesting at this point.

¹ *Census of Electrical Industries, Telegraphs, 1927.*

TABLE 50—TELEGRAPHS OF THE WORLD

Country	Telegraph wires		Number of telegrams sent	
	Mileage	Miles per 100 population	Total	Per capita
United States	2,300,000	1 9	235,000,000	1 9
Canada	360,883	3 7	15,680,000	1 6
Argentina	207,817	2 0		
Brazil	108,587	0 3		
France	520,000	1 3	37,545,000	0 9
Germany	304,000	0 5	30,200,000	0 5
Great Britain and North Ireland	364,000	0 8	54,267,000	1 2
Russia	500,000	0 3		
Italy	231,658	0 6		
China	120,000	0 03		
Japan	206,000	0 3	58,721,000	0 9

From Telephone and Telegraph Statistics of the World

The United States and Canada lead in telegraphic development and utilization, while Brazil, Germany, Russia, Italy, and China show the least development. The United States has approximately one-third of all telegraph mileage of the world and accounts for 44 per cent of all messages sent.

Improvements.—The telegraph systems of the United States have been undergoing a period of rehabilitation and improvement during the past two decades. As early as 1910 the Western Union System began the process of reconstructing and lengthening its land lines and modernizing its offices. It has been engaged consistently in replacing its old-type galvanized-iron overhead wires by copper wires, so that at the beginning of 1930 approximately 70 per cent of the land-line wire mileage was of copper compared with only 44 per cent in 1919. The replacement of heavily loaded aerial lines by underground conduits and cables in congested centers has been making rapid progress within recent years. The new zinc meta-arsenate process of preserving wood has been applied to poles in recent years at large saving to the company and prolongation of the life of the wood. The Western Union has also been engaged in the building of new and more commodious offices and providing other facilities for the improvement of its service in all parts of the United States.¹

Technical Advances.—Perhaps the most significant of all of the inventions affecting wire telegraphy is the automatic system of trans-

¹ The company's new 24-story building in New York City, covering an entire block, was completed in 1930 at a cost of \$13,500,000, including equipment. It provides space for the general executive offices and main operating departments of the company and is the largest telegraph center in the world.

mission which is utilized at both the sending and receiving ends of the line. It is the combined result of the inventive efforts of Wheatstone in England, Froment and Breguet in France, Siemens in Germany, and House in America. The advantages of the automatic system over the handicraft system of transmitting messages is in the greater speed and accuracy attained at a reduced cost. There are several of these systems in use at the present time. The most commonly used is the recording system. It is controlled by perforated tape, prepared on a keyboard instrument on the dot-dash code principle. This method is commonly used on older types of ocean cables. But the most generally used is the automatic-printing system made familiar to the general public through the stock and news ticker. This also employs, for the most part, the keyboard and perforation system. The operation of the long ocean cables by the automatic-printing apparatus was an accomplished fact already in 1919. The past decade has witnessed the especially rapid development of the system. The newer ocean cables and over 80 per cent of all land-line business in the United States use this system.¹ There is also the facsimile system used in connection with telautograph and telephotograph transmission. Most of these systems use the Baudot or five-unit code.

The automatic-printing system is operated in connection with the multiple system which produces from two to five separate transmissions in each direction simultaneously, reaching as high as 360 letters per minute per channel, which represents the limit of the operator. The multiple automatic-printing system is the work principally of Baudot with the five-unit code but was introduced into America by Farmer and became the basis of the improved Murray, American, and Markrum multiplex systems.

Repeaters—Already in 1919 the automatic service was being equipped with the universal and rotary high-speed type of repeater. This was further improved by regenerative signals on larger circuit, which increased speed further by 10 per cent.

Simplex System.—In 1926 the Western Union Company began the installation of the simplex-printing system. It has already almost entirely superseded the old-time telegrapher and the dot-and-dash method of transmission. It is also used to connect the main offices with the branch offices in the large cities and is now being extended from company offices to those of large customers, it has greatly improved the speed and facilitated office business. Ten thousand of these and a hundred 100-wire concentration units for terminal switching are currently being installed.

Other Improvements.—Among other recent improvements in the telegraph business may be mentioned the messenger-call service which enables customers to call messengers from the telegraph office. In 1929

¹ Already in 1919 the Western Union System had 368 automatic circuits in service, which handled 57 per cent of the total business.

over a quarter of a million call boxes were in operation. The Western Union Company has also recently equipped its offices in large cities with pneumatic-tube service for the efficient collection and distribution of messages. In 1925 the Western Union extended its ticker service to San Francisco and later to the Pacific Northwest and to the Southwest, today every part of the United States is provided with automatic ticker stock and bond quotations and news service. Ten thousand new speedier tickers have recently been installed. The newest of the devices is the teleregister which automatically registers commodity and financial quotations from a centrally operated board to local boards with a speed equal to the new ticker. Other innovations are the use of telegraph lines for simultaneous telephone conversations and time signals operated by means of electrically driven clocks connected with a limited number of master clocks, themselves controlled by the United States Naval Observatory. Signals are transmitted at noon each day and clocks automatically adjusted.

The Ocean Cable — It appears that the first suggestion of a submarine cable was made by Salva, a Spanish scientist, in 1798. Later its possibility was demonstrated by Morse, Wheatstone, and others, but cable construction awaited the introduction of gutta-percha as an insulator.

The ocean cable developed close upon the heels of the telegraph. The problem of the ocean cable was the problem of constructing a line strong enough to withstand its own weight and the disintegrating forces of ocean depths. But already in 1851 Dover and Calais were connected and, by connection with the land wires at these points, Paris and London were placed in communication. Comparative stock exchange quotations of the two financial centers were among the important messages transmitted.

The transatlantic cable was due mostly to the tireless energy and undaunted determination of Cyrus W. Field. He and Sir Charles Bright, head of the Magnetic Telegraph Company in England, organized the Atlantic Telegraph Company, the stock of which was sold mostly in England. Their first task was the manufacture of the cable itself, which took several years of effort. Finally in 1857 the laying was attempted by warships, the American *Niagara* and the British *Agamemnon* proceeding from opposite sides of the Atlantic. But the cable snapped in laying and these efforts were rendered fruitless. Finally in 1858 after several breaks, the ships met in midocean and spliced the ends. Thus, Hearts Content, Trinity Bay, Newfoundland, and Valentia, Ireland, were in communication. These points had previously been connected with New York and London and the continent. This cable carried a high potential current which burned it out and ruined the insulation after 3 weeks of use. Seven years of public derision followed.

But Field was not discouraged. With the cooperation of Lord Kelvin, he raised more capital, improved the construction of the cable, and by

1865 the *Great Easterner* started out from Valentia in another attempt. This ended in disaster when a break occurred after laying 1,200 miles. The following year the same ship left Ireland with a much improved cable which was spliced to the one laid the year before and successfully completed the task without any other serious interruptions. This cable was the first successful one to connect the two sides of the Atlantic. In 1869 the French Atlantic Telegraph Company opened a second line and three others were laid before 1877. Since 1866 Europe and America have been in continuous telegraphic communication. Cable systems have been extended to all parts of the world. In 1929 there were 21 cables across the Atlantic alone between North America and Europe. The total number in the world was 3,500 with aggregate length of 300,000 miles. The development of ocean cable transmission systems of the United States during the past decade has been nothing less than astounding.

The activities of American companies in cable transmission were apathetic prior to 1910. In that year the Western Union Company had only two cables across the Atlantic and these were only leased lines. It owned two short cables from Florida to Cuba. In 1910 it laid an additional cable from New York to England via Newfoundland and leased a number of others, making a total of eight transatlantic lines. In 1919 the company entered into contract with the Western Telegraph Company for connection at Barbados for service between United States and Brazil, Uruguay, Argentina, and on the west coast as far north as Lima, Peru. The All-America Cable Company also conducted a cable service from New York to Cuba, hence to the Panama Canal Zone, and from there along the west coast of South America. The outstanding company in the field prior to the war, however, was the Commercial Cable Company, familiarly known as the "Mackay Cables," which was the largest cable system in the world. It conducted a cable service mainly between America and Europe and across the Pacific Ocean to the Philippines.

But little progress in cable development was evident until about 1924 when the Western Union laboratories developed a new type of cable which represented the first change in technical construction since 1858. This new cable is known as the "permalloy cable" and is composed of a number of channels and costs about 25 per cent more than the old type. The expansion of American cable service really begins at this point. The first of the new type of cable was laid between New York and Horta in the Azores in 1924. It carries five different printing telegraph channels equal to five singly worked lines. It was at the time the longest and had the highest capacity of all the transatlantic cables, being capable of transmitting 1,500 letters per minute, as compared with the old type cable which for half a century preceding was capable of transmitting only 15 words per minute. In 1926 the company completed a cable of

the same type from New York to Penzance, England, via Bay Roberts, Newfoundland, which carries eight channels and is capable of transmitting 2,400 letters per minute

Western Union Cable Service.—The Western Union has developed its cable service in four main directions. It now has nine cables either owned or leased for the North Atlantic traffic to Great Britain and Europe. In 1927 it established for the first time direct connection from New York to Havre and Paris. In 1925 cables were leased extending from England to Emden for direct service to Germany. In 1929 direct-cable operation was established between New York and Berlin via London as a duplicate route to the Emden cable. A direct circuit from New York to London was also established in 1929, which brought the stock exchanges of these two centers into almost instantaneous connection.

These new transatlantic cables enable messages to be sent and replies received in less than 2 minutes time. This exceeds the speed thus far made by wireless. In 1928 this company laid another loaded permalloy cable across the Atlantic from Bay Roberts to Horta, Azores. This cable is designed to transmit in one direction 2,000 letters per minute, while the duplex apparatus will be expected to transmit 1,200 letters per minute simultaneously in each direction. It actually recorded a speed of 1,400 letters per minute simultaneously in each direction through the duplex method of transmission. This is by far the highest record ever attained by an ocean cable and is the first time a loaded cable has been successfully duplexed.¹ The cables to the Azores connect at Fayal with the new cable of the Italian Submarine Cable Company and from that point to Spain and Italy, establishing in 1925 for the first time direct connection between these countries and America. It also connects at the same point with the German Atlantic Cable Company's permalloy cable to Germany, completed in 1926. These connections gave direct cable service to these and other countries of southern Europe for the first time. The Western Union has further rounded out its cable service through connection established in 1924 at London with the Eastern Telegraph Company for Far Eastern traffic. It has by far the greater portion of the cable traffic from North America to Great Britain and Europe.² In 1919 this company also laid a cable from New York to Barbados, connecting there with the Western Telegraph cable for all important points in Brazil, Argentina, Uruguay, and extending up the west coast of South America as far as Lima, Peru. The number of miles of ocean cables of American systems increased from 71,251 in 1917 to 105,893 in 1927, and the number of cablegrams from 6,451,000 to 13,987,000.

Competition between cable companies and with wireless has been very great within recent years and has several times resulted in reduction

¹ *Annual Report of the Western Union Telegraph Company for 1929*

² *Annual Report of the Western Union Telegraph Company for 1928*

of rates to the point of unprofitableness. Substantial advances in the volume of deferred-cable business have been secured through reductions in rates for over-night and week-end service to Europe. The expenses of transmission are further reduced by the new cable code regulations. It appears that 85 to 90 per cent of cable messages from the United States are for business purposes. The Western Union Company handles 44 per cent of the business, another 43 per cent is taken care of by other American companies, and the balance 13 per cent goes to foreign companies.

At the end of 1930 Western Union's land and cable system comprised 217,458 miles of pole line, 1,911,257 miles of wire, 3,842 miles of land-line cables, and 30,757 nautical miles of ocean cables.¹ Improvements to plant and equipment since 1910 amounted to \$192,600,000, an amount considerably in excess of total plant account of that date. Of total capital requirements in these two decades, \$75,000,000 was raised from bond issues, \$3,000,000 from sale of stock to employees, and the balance, \$114,600,000, came from earnings.

International Telephone and Telegraph Company.—This is a holding and managing company which has gathered under its wing the leading telephone properties of Mexico, Cuba, Porto Rico, Argentina, Brazil, Chile, Uruguay, and Spain. Through exchange of its own stock it has also acquired all of the properties of the Commercial Cable Company, including the Postal Telegraph in the United States. Through similar arrangements it has also acquired the cable properties of the All-America Cable Company. It has in addition acquired the plants of leading manufacturers of telephone and telegraph apparatus in England, Belgium, France, Spain, Japan, Germany, and in other European countries. It also acquired control of the Federal Telegraph Company, engaged in wireless telegraph transmission on the Pacific coast, connecting with the leading American ports and the Orient. The company possesses important cable lines to Great Britain and Europe and beyond to Scandinavian countries and through its agreement with the Eastern Telegraph Company reaches the Far East. This company thus possesses the most comprehensive system of world cable communication service in existence and in addition controls the leading telephone service in Latin American countries. It has also established direct telephone service between Cuba and Europe and between Mexico and Europe and has established trans-Andean circuits between Chile, Argentina, and Uruguay. Altogether the company owns and sponsors approximately 62,000 nautical miles of cable lines. The Postal Telegraph reaches every important point in the United States. It has 350,000 miles of land line connecting with Canadian and Mexican systems. It has broadcasting stations at Havana, Cuba, and San Juan, Porto Rico. On the Pacific coast it has also

¹ *Annual Report of the Western Union Telegraph Company for 1930*

established a point-to-point wireless system and ship-to-shore wireless service. In 1928 it had 16,719 employees.

Wireless Telegraphy.—As early as 1865 J. Clerk Maxwell advanced the idea that electric action was capable of being propagated through free space in the form of a disturbance traveling with the speed of light. In the eighteen hundred eighties Heinrich Hertz published an account of experiments in wave motion based upon Maxwell's electromagnetic theory which formed the basis of waves used in wireless. Finally in 1901 G. Marconi established communication between Poldhu, England, and St. Johns, Newfoundland, a distance of over 2,000 miles. From that time on, wireless telegraphy has made rapid progress, competing with cables with increasing success for transatlantic traffic for 20 years or more.

Powerful wireless stations can be established at comparatively little cost in competition with cables for long-distance traffic. For example, the past 3 years have witnessed acute competition between cable and wireless service between England and Australia, and from New York to Berlin and South America. Wireless takes every kind of traffic including music, speech, pictures, signatures, facsimiles of printed pages, and television. The service in most types of transmission is much faster than cable service and hence secures much traffic from land wires and the cable companies. The great defect of wireless service is that it is not secret. Anyone with a receiving apparatus may pick up the messages, unless the rather cumbersome "scrambling" of code messages is employed. For this reason the newspapers use cables, even though the cables are expensive and require duplicate lines on routes to insure against the time of interruptions in service on single cables through leaks, which often require several weeks for repairing. Wireless also is subject to breakdowns of aërials in storms, failure of machinery, or power supply, "atmospherics," and "fading." For the last two defects no real remedy has yet been found, but they have been largely corrected through the use alternately of long and short waves. All in all, the wires are more dependable and accurate and the numerous duplications of machinery and other apparatus and paraphernalia of transmission of wireless are increasing the costs to figures equal to those for cable transmission.

The principal function of the wireless in the future is thought by some to be that of supplementing the wire systems. Wireless telegraphy reaches remote inland countries and districts inaccessible by wires and cables, serving such industries especially as fishing, mining, and lumbering. It also appears that messages over long stretches of the Pacific Ocean, where the time element is not an item, can be transmitted more cheaply over wireless during favorable atmospheric conditions. Officials of the Western Union Company have for many years watched the development of wireless telegraphy and the radio and have come to the conclusion in the words of President Newcomb

Carlton that "our faith reposes in the wires. It will be found by those who compete for land telegrams that the medium of connecting the thousands of villages, towns and cities is incident to the major problem of collecting and distributing the millions and millions of messages"¹ The Western Union has been almost entirely inactive in wireless communication but has recently made a number of agreements with wireless companies. For instance, it has a contract with the Radio Corporation lasting until 1944 for the collecting and distributing of the Far Eastern traffic, and also for the exclusive land-line transmission of messages from ship to shore. On the other hand, the International Telephone and Telegraph Company has gone forward and developed to a considerable extent its radio business, particularly in foreign countries.

Revenues.—Operating revenues of American companies come largely from land lines. In 1927, 90.4 per cent of all operating revenues were from this source, the balance coming from ocean cable lines. This compares with 86 per cent in 1912. Doubtless the keen competition of the past decade and reduction in cable rates have been chiefly responsible for this result, since ocean cable service has shown large increases within the recent past. In addition to the income from telegraphic service, there is the usual item of other income from investments and various other sources.

The trend of revenues of land-line business was strongly upward in the decade 1917–1927, having risen about 75 per cent in the period, while cable revenues increased only about 15 per cent.

Operating Expenses.—Operating expenses of land systems increased 82.5 per cent in the decade 1917–1927, while cable companies showed only 6.4 per cent increase. The increasing expenses of the recent period have been due to several causes. Liberal treatment of labor has become a fixed policy of the Western Union Company, which handles 85 per cent of all land-line business. In 1913 it began its system of employee pension and disability and death benefits, which in the two years following cost the company \$17,800,000.² In 1920 the same company inaugurated its employee income participation plan, which from 1920 to 1928 cost \$15,531,000.³ The company also allows vacations with pay to employees and in 1928 alone \$2,522,000 was paid in this way.⁴ But the greatest liberality shown employees has been in the wage scale. Average wages of Western Union employees have been more than doubled in the period 1916–1929, while the cost of living rose only 56 per cent. Out of every dollar of gross revenue in 1929, 60 per cent was for wages, pensions, and disability benefits.⁵ Taxes assignable to operation for all telegraph and cable

¹ *Annual Report of the Western Union Telegraph Company for 1928*

² *Annual Report of the Western Union Telegraph Company for 1923*

³ *Annual Report of the Western Union Telegraph Company for 1928*

⁴ *Ibid*

⁵ *Annual Report of the Western Union Telegraph Company for 1929.*

companies amounted to \$7,064,000 in 1927 which amount approximated 20 per cent of operating revenues and exceeded by 15 per cent dividends paid in that year. The burden of taxes continued to grow through the depression. In 1931 the Western Union Company paid substantially more taxes than it did in 1929; in 1931 they amounted to \$3 36 per share of stock.¹

Operating Ratio.—In spite of the liberal policy of the Western Union System toward labor, the operating ratio (operating expenses includes maintenance and depreciation but not taxes) of all telegraph and cable companies in the United States rose from 77 per cent in 1912 to only 80 per cent in 1927.

Net Income.—Net income from operation (after interest and taxes) of all companies lagged behind increases in plant and equipment from 1917 to 1927. With an advance in plant and equipment of 57 per cent, net income advanced only 22 per cent. There was only a moderate amount of indebtedness in this period, so that the interpretation of this result is anything but favorable. This amount represented a return of only 4 3 per cent on plant and equipment (before depreciation for which large reserves are carried), taking no account of working capital and other assets. Net operating revenues of Western Union Company in 1926 represented about 6 per cent return on the value of plant and equipment. This unfavorable result is attributable not a little to the increase in taxes from 1917 to 1927, amounting to something like 50 per cent.

Cyclical Fluctuations.—General business conditions are to a considerable extent reflected in telegraph receipts. Western Union receipts showed a large bulge in 1920 followed by a rather severe drop the next year. Likewise 1929 shows a sharp peak only to be followed by a drop of 26 per cent in 1931. Expenses appear to rise with revenues, so that years of prosperity show only a comparatively small addition to net income. But depression years find only tardy adjustment of expenses to revenues with disastrous results on net operating revenues. Net operating revenues in 1931 dropped 40 per cent from the figures of 1929. Ocean cable revenues fluctuate more violently than domestic wire revenues.

Seasonal Variations.—Seasonal influences are noticeable in telegraph revenues. They show a low point in the first quarter of the calendar year, rising to a peak toward the end of the third quarter with a gradual recession during the fourth quarter.

Capitalization.—In the early period of development telegraph companies furnished ample illustrations of abuse in finance. The report of the Industrial Commission of 1900 showed that stock dividends of the Western Union Telegraph Company between 1858 and 1866 amounted to \$17,810,146, total capital stock was \$20,133,800 in 1866. In 1867 the capital stock jumped to \$40,568,300 and by 1900 it had increased,

¹ *Annual Report of the Western Union Telegraph Company for 1931.*

largely through consolidation, to \$131,364,665. The highest estimate of any legislative committee placed the amount paid in by stockholders at \$16,000,000, while the railroad commission of North Carolina claimed the property could be duplicated for \$30,000,000 at the outside. Nevertheless, throughout this period cash dividends were generally 5 or 6 per cent annually.

The capitalization of telegraph companies within the later period has been highly conservative. Total capital issues in 1912 were approximately equal to plant and equipment account alone but fell to about 65 per cent in 1927. This is largely a reflection of the recent policy of the companies of plowing earnings back into the property. The Western Union has long followed the policy of an equal division of surplus earnings between stockholders and improvements. The surplus account of this company, January 1, 1931, amounted to \$95,000,000 against capital stock of \$105,000,000.

Western Union capitalization at the beginning of 1931 was as follows:

Capital stock	\$105,000,000
Funded debt	107,955,000
Total	\$212,955,000
Property account	331,916,000
Plus	95,692,000

Bonds.—The Western Union Telegraph Company has \$20,000,000 Funding and Real Estate Gold Bonds, issued in 1900 and due in 1950, with coupon rate of $4\frac{1}{2}$ per cent. They are a lien on all real estate with buildings, equipment, and fixtures thereon in New York City and Chicago. There is also an old 5 per cent collateral trust issue of \$8,745,000 dating back to 1888, which is a relic of the period of consolidation of various companies with the parent company. The collateral consists of the stocks and bonds of merged companies in about equal amounts, the dividends and interest on which have been guaranteed by the parent company at 6 and 5 per cent, respectively. The bonds are due in 1938.

In 1926 the company issued a 5 per cent Gold Debenture Bond due in 1951 and redeemable as a whole after December 1, 1936–1946, at 105 and after that at lessening premiums as maturity approaches.

In 1930 a similar issue for \$35,000,000 bearing interest at 5 per cent due in 1960, redeemable as a whole after March 1, 1940–1950, at 105 and after that in decreasing amounts till maturity.

The interest on total funded debt was earned $5\frac{1}{3}$ times over in 1929 and 2 $\frac{1}{4}$ times over on the increased amount in 1931, the severest year the company experienced in two decades. These are issues of high quality and are all listed on the New York Stock Exchange.

Stock.—The stock of the Western Union Company has steadily improved during the past 20 years in both asset value and earnings.

applicable to the stock. Surplus account now approaches the amount of the stock and dividends are regularly earned twice over. Dividends have been paid regularly on this stock since 1856, the date of the present organization. Earlier in the history of the company, stock and scrip dividends in liberal amounts were added to regular cash dividends, increasing from 3 per cent in 1909 to 8 per cent in 1926. In 1916, 1917, and 1918 extra cash distributions were made. Earnings declined to \$9.03 per share in 1930 and to \$5.71 in 1931. Following this severe decline, dividends were cut to 4 per cent and later dropped entirely.

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CHAPTER XXV

THE TELEPHONE

The telephone is an instrument for the transmission of human speech with its varying intonations. The transmission of speech awaited the ability to transmit sound itself. The telegraph merely transmits electrical impulses and code telegraphy consisted only in the making and breaking of circuits thus timing the duration of the impulse. But the telephone set in motion by the human voice picks up sound waves and transmits them faithfully to the point of reproduction.

Early Experiments.—Honor for the first transmission of sound seems to belong to Philipp Reis, a German, who in 1861 succeeded in transmitting sound of constant pitch but was incapable of transmitting continuous speech. Reis, like Bourseul in France and Meucci in Italy, was working on the problem of the transmission of speech but in this he and his predecessors failed completely. Honor for the invention of the modern telephone unquestionably belongs to Alexander Graham Bell. He first stated the correct principle upon which the transmission of speech depended in the following words. "If I could make a current of electricity vary in intensity precisely as the air varies in density during the production of sound, I should be able to transmit speech telegraphically." By the use of a continuous current of electricity intensified and diminished in harmony with sound waves, the telephone finally emerged.

Alexander Graham Bell was born in Edinburgh and came from a family famed in teaching elocution. The younger Bell himself became an expert in acoustics, elocution, and electricity. He was experimenting with crude harmonicas in two basement rooms connected by wire and with a magnet attached when his assistant, Watson, snapped a reed in one room, whereupon the twang of a clock spring was transmitted to the other room where Bell was. This is said to be the first complete sound carried along a wire and perfectly reproduced. Bell learned how Helmholtz had set a tuning fork humming by means of an electromagnet. He immediately went to work to produce a musical telegraph which would transmit many sounds over the same wire simultaneously by means of a piano keyboard.

At this juncture a plague struck the family and Bell and his father emigrated to Canada, where the former taught visible speech to the Mohawk Indians. In 1871 he went to Boston as teacher of deaf-mutes, where he created a sensation and became professor in Boston

University. He made his home with the Sanders family as tutor of Georgia Sanders, a deaf-mute. In the Sanders basement he set up a workshop. He soon met Mabel Hubbard, fifteen years old, daughter of a well-known Boston lawyer, who had lost her speech and he promptly fell in love with her and later married her. Hubbard himself was interested more in the musical telegraph than in the telephone and encouraged Bell along this line. At the suggestion of Dr. Blake, a dead man's ear was used for experimenting upon transmission of vibrations, which were recorded on a moving smoked glass. From this experiment the idea of a membrane telephone flashed through his mind. He pictured two iron discs or eardrums catching vibrations at one end and reproducing them at the other. This constituted the first theoretical knowledge of the telephone. Three months after he heard the twang of the clock spring over the wire, Bell sent for Watson and after experimenting for 40 weeks, on March 10, 1876, his instrument talked. He spoke from three flights upstairs to Watson in the basement saying, "Mr. Watson, come here, I want you."

Bell's claims to the invention of the telephone did not go unchallenged. Professor Elisha Gray filed a caveat in the patent office only a few hours after Bell made his application for a patent on an "improvement in telegraphy." Other contestants were Professor Dolbear and Mr. Drawbaugh. All these claimants involved the invention of the telephone in extensive litigation, the conclusion of which was that Bell's claims received official sanction. Bell first exhibited his invention at the Philadelphia Centennial Exposition to Don Pedro, Emperor of Brazil. Many men of prominence came to view the invention, among whom was Lord Kelvin who pronounced it the most wonderful thing he had seen in America. But the public still ridiculed Bell and pronounced him an impostor. Although there were many shrewd capitalists at the time in America, none came to Bell. The difficulties of Bell in interesting financial support for the commercialization of the telephone in the early stages of development were endless and it is no compliment to American financial leadership that only deaf ears were encountered.

The telephone was first shown to be practical when Bell attached the instruments to the telegraph wire from Boston to the Cambridge observatory, a distance of 2 miles, whereupon he held a 3-hour conversation with Watson, the first sustained communication by telephone. Each kept a record of what was said and, after verification, the conversation was published in the press. An account of an election sent by telephone 16 miles to the *Boston Globe* was the first news service in telephony. By this time the skeptics were rapidly disappearing.

The Exchange.—The commercial development of the telephone was undertaken by Thomas Sanders, Gardiner G. Hubbard, and a few others. The idea of the exchange had not yet occurred to them. The first tele-

phones were single iron wires with instruments attached to both ends, usually connecting the offices of business men with their homes. The first step in the commercial exploitation was the renting of instruments to parties who desired to establish communication of the sort mentioned. Methods of calling were at first crude and transmission poor and unreliable. In 1877 a step in advance was made when a crude exchange was used and the telephone was employed in connection with a burglar-alarm system in Boston. It was next installed in the express company's office and then in other business offices. In 1878 the first telephone switchboard for commercial purposes was put into operation at New Haven, Conn., and had 21 subscribers. The renting or license system continued to be the policy of the patent holders. Licenses were granted to many parties wishing to establish exchanges in various parts of the United States. It should be noted in passing that, for sentimental reasons, Sanders furnished nine-tenths of all the money to finance the invention and promotion of the telephone between 1874 and 1878. The first 500 telephones were made with Sanders' money, although he could not afford the outlay.

In order to exploit the idea, two companies were formed to succeed the Bell Telephone Association, the earliest organization of Bell, Hubbard, Sanders, and Watson. The two companies were the New England Telephone Company and the Bell Telephone Company. Their method of procedure was to rent the instruments to private parties who constructed their own lines, since the telephone was yet only a private line connecting two stations. The New England Company acquired all of the patents for the New England district, while the Bell Company had similar rights for the remainder of the United States and control of the instruments was maintained through these companies. Neither the public nor the bankers were impressed at this time with the possibilities of telephony. This threw the problem of financing back upon the slender resources of the promoters and inventor and they were inadequate for the purpose. At this juncture Theodore N. Vail who had made a record as organizer in the Post Office Department at Washington was called in to take the active leadership and was made general manager in 1878. It was decided to organize a single company, The National Bell Telephone Company, to succeed the two other companies. It was chartered in 1879 with \$850,000 in stock of \$100 par value per share. So difficult was it to sell stock that the promoters had to accept \$50 for the first amount sold. But a few months changed the situation from one of indifference to one of boiling enthusiasm and the last 500 shares brought \$600 each.

The next chapter of telephone history has to do with the settlement of disputes in relation to patents. The powerful Western Union Telegraph Company, by which Thomas Edison was employed at that time and which had a monopoly hold on a large part of all communication business,

had joined interests with Elisha Gray for the exploitation of his claims and threatened to submerge the Bell interests through their greater resources. Mr. Edison's improvements were already of great importance and the Western Union appeared to be the victor in the intense competition that arose.¹ But the invention of the Blake transmitter by the Bell interests gave them the advantage in equipment. While patent litigation was pending against the Bell interests, an agreement with the Western Union interests was reached in 1879, whereby Bell was recognized as the inventor of the telephone, all of the latter's property and patents were to be acquired, and all litigation cease, leaving the Bell interests in control of all of the important patents relating to telephones, this preempted the field for the future. Gray, however, was a constant fighter for recognition as the inventor till his death in 1901. The Bell Company fought, in all, 600 or more lawsuits, 5 of which were taken to the Supreme Court. In the fiercest litigation involving any patent in history, the Bell interests lost only two unimportant cases. As Casson remarks, "No inventor had ever a clearer title than Bell."

From this time onward, the Bell interests never once halted in the pursuance of their program which was the foundation upon which American telephony has reached its high status. It is enlightening at this point to rehearse the fundamental policies of the new organization:

- 1 No patents were to be sold
- 2 Contracts for lease were for 5 years only
- 3 Each licensee was confined to one place
- 4 The right of inter-city connection was reserved to the Bell interests
- 5 A department to protect new inventions was established
- 6 The company took stock in licensee companies for royalties
- 7 The company controlled the factories for the making and standardization of apparatus

From the first, the idea of the creation of a national telephone system possessed the leaders. Bell stock advanced to \$1,000 per share. This marked the end of pioneering in the telephone business. The days of ridicule were over. A few months afterwards, in 1880, the old company was succeeded by the American Bell Telephone Company with \$6,000,000 capital.

After that, the telephone advanced rapidly in use and the company's financial status was assured. Only 2 years afterwards, the first switch-board was installed in New Haven, Conn. At the end of 1880 already there were 123,380 telephones in use, while in the United States in the following year there was only one city of 15,000 population or more without an exchange. The National Bell Telephone Company, when it ceased its corporate existence at the close of 1880, had 338 stockholders, who averaged about 25 shares each. But 12 holdings aggregated 4,795

¹ At one time the Bell patents were offered to the Western Union Company for \$100,000, but they were refused.

out of 8,500 shares. It may be said in summary that the telephone was invented by Bell, constructed by Watson, financed by Sanders, introduced by Hubbard, and placed on a business basis by Vail.¹

Period of Monopoly—But in 1880 the business was growing so rapidly and the company so badly in need of funds that it decided to form a new company of \$10,000,000 authorized capitalization. Each share of the old company was exchanged for six shares of the new, other shares were sold to the public which brought in most of the needed cash, while a large amount of unissued stock remained for future financing. The following 14 years, until 1894, the company operated under a monopoly, until the expiration of the Bell patents. Instruments licensed under former companies ran mostly for 5 years, upon the expiration of which the company had an option on the plants of the operating companies. The Bell management finally decided upon the substitution of permanent, for the temporary, contracts, rather than seek to operate the properties themselves through one vast nation-wide organization. The new contract continued the license fee, usually with a substantial reduction in the fee charged, and omitted the option on the property at a future date, for which the American Telephone Company received a bonus of stock in the operating company amounting to as much as 50 per cent in some later contracts. These contracts also protected the parent company by forbidding the use of any other than Bell patents by the associated companies, they also forbade establishment of any connections with independent lines under penalty of losing control of all property upon payment of a reasonable consideration by the parent company. This latter provision protected the interests of the American Telephone Company after the expiration of the patents. From this time onward, the company pursued the policy of acquiring more stock at every opportunity until today it has almost 100 per cent ownership in most of the associated companies.

Western Electric Company.—Soon the Bell Company decided upon a policy of integration for future development. It owned all the patents but possessed no adequate means of manufacturing the instruments and found difficulty in getting uniformity in its products manufactured by various licensees of the patents. Consequently it decided upon the acquisition of the Western Electric Manufacturing Company, a company organized in 1869 by men connected with the Western Union Telegraph Company, including Elisha Gray, and interested in manufacturing telegraph instruments. The Bell Company acquired a controlling interest in this organization in 1882 and formed a new organization, the present Western Electric Company, which was made the exclusive

¹ Within the next few years over a hundred competing and disputant companies with an aggregate of \$225,000,000 of capital had organized promotion schemes. Only a few of these ever sent a message.

licensee for the manufacture of telephone instruments for the Bell Company, with the exception of only four small companies previously licensed to manufacture these instruments. These contracts forbade the sale of instruments to any outside parties in the United States and Canada. Eventually under this arrangement, the Western Electric became the sole manufacturer of telephone instruments for the Bell Company. An agreement was entered into between these two companies which remained unaltered till 1908. It provided that (1) the Bell Company be permitted to acquire at cost all patents of the manufacturing company and the latter have the privilege of manufacturing instruments under these patents, (2) the manufacturing company was to stand ready at all times to furnish the Bell Company all the telephone equipment needed, and according to the specifications of the Bell Company; (3) the price was to be the actual cost plus 20 per cent profit, and (4) the contract could be terminated by mutual agreement.

American Telephone and Telegraph Company Organized.—With the construction of metallic circuits in the early eighties, the distance over which telephonic communication could be established was indefinitely increased. The first long-distance experimental line was strung on the poles of associated companies between New York and Boston in 1884. The success of this experiment led to the construction of the first long-distance line between New York and Philadelphia the following year and was jointly financed by the New York and the Bell companies on an equal basis. The success of these lines presented the imperative necessity of finding adequate means of financing future long-distance lines. The Massachusetts laws under which the Bell Company was organized were too rigid and the legislature too indisposed to allow an increase in capitalization, so that it became necessary to organize the American Telephone and Telegraph Company under the laws of New York in 1885. This company was to be the operating licensee company for long-distance lines and its capital stock was owned entirely by the Bell Company. This left the Bell Company a holding company and outside the public-service laws of Massachusetts, which gave more freedom in financing. Money was furnished the new company out of the earnings of the Bell Company, by the issue of \$2,000,000 of 7 per cent debentures in 1888, maturing in 10 years, and by securing an authorized increase of capital stock the following year to \$20,000,000, although \$30,000,000 was desired but denied by the authorities. After this the extension of the long-distance lines proceeded rather rapidly and by 1892 New York was in direct communication with Chicago. At the time of the expiration of the fundamental Bell patents in 1893, the American Telephone and Telegraph Company had a total investment of \$6,433,149 secured from its own earnings and sale of stock to the Bell Company, it had 3,695 miles of line in operation and 516,491 telephones in use.

Financing.—During the period of monopoly, financing was one of the difficult problems for the parent and associated companies alike. The main source of new funds seems to have been from the earnings themselves, although the associated and parent companies all issued stock to the old stockholders or to the general public. These sources, together with the \$2,000,000 bonds issued by the Bell Company already noticed, constituted the means of financing during this period. But the parent company, limited by Massachusetts statutes, was closely circumscribed in its ability to render direct assistance. Indirect aid was given, however, through the acceptance of bonus stock from the associated companies for the right to use the patents. Moreover, financing by the associated companies seems to have been a policy of the management from the beginning in order to foster cordial relations with public authorities. Dividends were limited in the early years to provide for financing of new construction. The consolidated accounts of all the companies in 1893 would have shown construction valued at about \$72,500,000 and the value of bonus securities received in exchange for patent rights was over \$16,637,000.

Period of Competition.—After the Bell patents expired, the system was confronted with a great deal of potential, and considerable actual, competition. A rather powerful group of men organized the Telephone, Telegraph, and Cable Company with headquarters in New York and capitalized at \$30,000,000. Its name is sufficient to indicate its ambitions, which were nothing more than nation-wide system to compete with the Bell system. Other groups organized companies in Baltimore and Cleveland and other cities with competition in mind. The greatest field for the independents, however, was in the Middle West, where the services of the Bell System either were unsatisfactory or had not yet reached. Except for the New England Telephone Company, which was organized in 1885 and the Bell Telephone Company of New York organized in 1896, little progress was made toward combining the Bell companies into large operating units. The financing of the company's needs during the nineties was accomplished by submitting to the Massachusetts statutes, requiring that the company be recognized as a public utility. The company was now authorized to issue capital up to \$50,000,000 to be sold at a price fixed by the Massachusetts Commissioner of Corporations. But the price was almost invariably fixed below market price and the Bell Company decided to finance by means of bond issues. It issued debenture bonds of 10 years' duration which were well received by the public.

The American Telephone and Telegraph Company Assumes Responsibility.—Under the Massachusetts laws a public-service corporation is forbidden to control over 30 per cent of the stock of another company, to declare stock dividends or to sell stock at less than market

price These considerations led the company to transfer all of its property in 1900 to the American Telephone and Telegraph of New York The company took this step reluctantly because over 85 per cent of the stockholders resided in Massachusetts The transaction amounted to a split-up for the stockholders, since two of the new company's shares were given for one of the old, which was selling for over \$200 and paying a 15 per cent dividend From this time forward the American Telephone and Telegraph Company becomes the parent company, the old company passing out of existence

A period of intense competition between independents and the Bell System ensued after 1900 But in New York and Boston they were unable to make much progress for various reasons, among which were franchise difficulties in New York In long-distance service the independents found their greatest handicap In western localities the independents operated with the greatest chance of success but even here no great success was attained They almost invariably charged rates too low for their own survival and as time passed found it necessary to raise them They neglected depreciation charges in most cases and their financial structure contained liberal amounts of water All in all, Stehman finds that the results of competition were (1) improved service of the Bell system, (2) misrepresentation, fraud, bribery, and injury to investors in independent system, and (3) heavy overcapitalization of independents with poorly constructed lines, low rates, poor accounting, payment of dividends out of capital, and in many cases receiverships¹ The Bell companies were never seriously threatened Their system grew more rapidly than the independents Both, however, increased service at an enormous rate.

Most progress was made by the independent interests represented by the Telephone, Telegraph, and Cable Company, who secured control of the Erie Telegraph and Telephone Company This was a holding company for the strongest western units, including the Cleveland Telephone Company, the Northwestern Telephone Exchange Company, the Southwestern Telegraph and Telephone Company, the Michigan Telephone Company, and the Wisconsin Telephone Company. But this group encountered financial troubles, and in reorganization in 1902 control passed to the American Telephone and Telegraph Company at advantageous figures

At the time the American Telephone and Telegraph Company succeeded the Bell Company, the associated companies, including the Western Electric, had outstanding \$139,000,000 of stock and \$18,500,000 of bonds The parent company owned about \$70,000,000 of the capitalization, or about 45 per cent. It increased its holdings gradually by

¹ C F STEHMAN, *Financial History of the American Telephone and Telegraph Company*, pp 94-95

open-market purchases, and by accepting stock in payment of subsidiary short-time obligations. Funds for this were obtained by the parent company through rights issued to old stockholders to subscribe at par for the new issues, the old stock having sold above par for many years. For expansion purposes the parent company decided upon the issue of collateral trust bonds in large amounts. But so rapid was the expansion of the industry that in 1906 it became necessary to raise \$100,000,000 more, which was done by issuing a 4 per cent debenture bond due in 1926 and convertible into stock at 140 within specified dates. But owing to the financial stringency of the times, these bonds sold at a considerable discount, mostly at 91. By 1907 the capital structure had altered considerably, instead of the almost complete absence of bonds of the earlier period, there was a funded debt of \$202,523,000 against common stock of \$509,775,000. Up to this time preferred stock had never been sold to the public, although the subsidiaries showed \$35,541,000 which originated in consolidation in Pacific coast companies and the reorganization of the Erie Company. All the funds raised after the American Telephone and Telegraph Company took charge were from issues of the parent company.

In 1908 the straight-laced contract of 1882 with the Western Electric Company was modified so as to enable that company to sell equipment to independents. This produced uniformity for connecting lines and increased the business of the Western Electric. A somewhat higher price was to prevail to cover extra selling expenses that were not incurred in connection with the parent company. Operating companies were also permitted to sell to independents. The Western Electric also

TABLE 51—PROGRESS OF THE TELEPHONE INDUSTRY

Year	Miles of wire, thousands	Number of telephones in use, thousands	Investment in plant and equipment, millions	Operating revenue, millions
1902	4,850	2,315	\$ 398	\$ 81
1912	19,019	7,326	1,081	244
1922	35,502	12,295	2,129	637
1927	62,277	16,712	3,475	996
1930	71,710 ¹	20,068 ¹	4,595 ²	1,284 ²

From *Census of Telephones, 1927*

¹ Figures from *Telephone and Telegraph Statistics of the World*

² Figures from *Public Utility Points*, Bonbright and Company, 1931

expanded its functions by acting as purchasing agent and storekeeper for all supplies for the Bell System. Contracts were drawn up requiring Bell companies to purchase exclusively from Western Electric at scheduled (but flexible) prices.

Recent Progress.—With the election of Theodore N. Vail to the presidency in 1917 came a change of fundamental importance for the subsequent history of the company. He conceived the telephone industry as a great public servant. To realize this, he embarked upon an enormous program of expansion, connection with rural and other independent lines, and reduction in rates. Publicity of all the affairs of the company in the spirit of a partnership with the public and investors was part of his program, thus laying the foundation for public confidence and good-will which prevails today toward the Bell System. When most men opposed public regulation of utilities, he came out strongly for it.

The Telephone Naturally a Monopoly.—The telephone industry is the most naturally monopolistic of all industries. The Bell System has steadily extended its control over the industry in the United States. In 1912 it possessed 70 per cent of all wire mileage and 57 per cent of the number of telephones, in 1927 these figures stood at 90 and 82 per cent, respectively. There are still, however, about 7,400 independent systems with 13,000 exchanges and 4,500,000 telephones in the smaller cities and rural communities of the country. All but 100,000 of the telephones operated by independents are connected with the long-distance lines of the Bell System, thus enabling their subscribers to get the benefit of the Bell service. Mention should be made also of 50,000 or more small cooperative lines largely in rural districts.¹ Competition between the Bell System and independents has almost entirely disappeared. The expensiveness and inconvenience to subscribers of obtaining the services of two systems could not long be tolerated. Mutual cooperation along the lines laid down by President Vail has resulted in territorial monopoly for the respective companies and interconnection of systems to the profit of the public.

Technical Progress.—One of the major improvements of the Bell System within recent years has been the extension of underground and aerial cables for toll wires. In 1925 the first cable from New York to Chicago was put into service. In the 5-year period prior to 1931, toll wires in cable increased from 58 to 77 per cent of total toll wires; 75 per cent of the cities of 50,000 population or more are now connected with toll wires in cable.² These give more dependable service, since they are largely immune from storms and in addition give better transmission than the open wires.

The development of the automatic switchboard has been in progress since the seventies when patents were first applied for. In 1889 A. B. Strowger invented a successful automatic-switching board known as the "step-by-step" system. The Bell System first introduced for final

¹ Figures from *Public Utility Points*, Bonbright and Company, 1931.

² *Annual Report of the American Telephone and Telegraph Company*, 1930.

tests a large number of the panel type of automatic switching in 1914. Under this system, however, automatic switching took place only after the customer called the operator in the usual way. The first exchange giving complete automatic dial service of the panel type was installed in 1921. This insures service during all hours of the day and on Sundays and holidays. At the present time about one-third of all the telephones are of the dial type. Incidentally it may be noted that telephone operators increased 21 per cent during this period. Small dial intercommunication systems for residence and business establishments have added greatly to the convenience of the public.

Long-distance Telephony.—Long-distance telephone service may be said to have begun with the 2-mile wire between Boston and Cambridge in 1876. In 1880 Boston and Providence were connected and in 1884 Boston and New York. Service was extended westward to Chicago in 1892 and on to Denver in 1911, to Salt Lake City in 1913, and in 1915 to San Francisco. A second line was constructed across the continent via New Orleans, a third via Minneapolis has since been completed. The development of the cable, particularly the underground cable, has vastly extended the long-distance service. Much of the industrial area of the United States is now connected by long-distance cable, mostly of the underground type. These cables extend as far west as St. Louis and Kansas City, and to Portland, Maine in the East. The cable from New York to Cleveland has a capacity of 250 telephone, and as many telegraph, messages simultaneously. New York and Chicago are connected by three different cable routes.

Extension of Service.—Extension of radio telephone service beyond the borders of the United States is a product of the past decade. For the first time in 1915, the human voice was transmitted by radio across the Atlantic from Arlington to Paris. San Francisco and Hawaii were connected in the same year. The first extension of telephone lines beyond the borders of the United States took place in 1921 over 115 miles of deep-sea cable from Key West, Fla., to Havana, Cuba. In 1922 came the first ship-to-shore conversation by wire and wireless between telephones in homes and offices with the steamship *America* 400 miles at sea. The following year saw the first demonstration of transatlantic radio telephony from New York to New Southgate, England. In 1926 the first two-way radio telephone conversation between New York and London was held and in the following year transoceanic service was opened between New York and London, later extended to all parts of the United States and Great Britain. Messages eastbound across the Atlantic are sent from the radio sending station at Rocky Point, Long Island. The message is received at the British Post Office radio station at Cupar, Scotland, and transmitted by wire to its destination. Westbound messages sent from Rugby, England, are picked up at Houlton,

Maine, and thence sent by wire to their destination. Radio telephone service has been extended to many parts of the world, some 25 countries including Sweden, eastern and southern Europe, Argentina and Chile, and Australia. At the present time practically any telephone in the United States can be connected with any one of 32,000,000 telephones, out of the 35,000,000 telephones of the world. Plans are under way for extension telephone service to Honolulu in 1932 and eventually to other Pacific islands and the Asiatic mainland.¹ The original communication across the Atlantic was by long wave but at the present time there are three short-wave channels. Active work is now in progress in the Bell laboratories on the construction of a transatlantic telephone cable which is to connect Newfoundland and Ireland.

Outlook.—A number of statistical comparisons reveal present trends in the telephone industry. Perhaps the broadest and most significant comparison is the increase in the number of telephones as compared with the population. The number of telephones in the Bell System was 11,065,000 in 1918, and 19,197,000 in 1928, an increase of 73 per cent during the decade compared with an increase of but 12 per cent in population. This would seem to indicate that the telephone has by no means reached the saturation point. In spite of the increase in number of telephones, the number of per capita telephone conversations within the Bell System has shown only slight tendency to decrease within the past 20 years and is now more than three per day. The phase of the industry developing most rapidly is the toll business. The average number of daily conversations increased 130 per cent from 1908 to 1918, and 166 per cent during the the following decade.

Regulation.—Prior to 1907 there was practically no public regulation of the telephone business as it is known today, although in several of the southern states (Mississippi, Louisiana, North Carolina, and Virginia) commissions had jurisdiction in certain matters but were generally inactive. The merits of competition were tested during the period following the expiration of the Bell patents in 1893 and 1894. It was the custom, however, to require many companies securing their charters during this period to give a certain amount of public service, such as the installation of telephones on a free or reduced-rate basis in public buildings, police departments, and fire service. In a number of cases they were required to pay into the city treasury stipulated amounts annually, as, for instance, 3 per cent of gross earnings paid by the Frontier Company of Buffalo and the Chicago Telephone Company of Chicago. This, however, resembled a tax more than regulation.

Prior to 1907 it was the usual thing for the city to stipulate in the newly granted charters the rates to be charged customers. And it must be said that the municipalities in many cases drove hard bargains, causing

¹ *Wall Street Journal*, Aug. 6, 1930.

the financial failure of many companies. It has been claimed that rates were below the cost of service and generally under those charged by the companies in the Bell System previously established. The Supreme Court ruled against established rates which were deemed to be too low. This weakened all city control over rates, following which some companies refused to pay the bonus taxes. The Bell companies starting with considerably higher rates than franchise rates to independents, as well as to certain Bell companies later established, lowered their rates before 1907. State commission control over rates, regardless of franchise provisions, seems now to be fairly well established.

State Commissions.—Active regulation by commissions was first introduced in 1907, when Alabama, Georgia, Nebraska, Nevada, Oklahoma, Pennsylvania, and Wisconsin brought telephone companies under commission control. Georgia had control over capitalization as well as rates and service. The Nebraska commission issued many orders dealing with rates and service and its permission was necessary for capital issues. The Wisconsin Railway Commission attacked the problem of telephone regulation in earnest. It began by requiring full and detailed accounting by the companies, which formed the basis of its own orders, a step not taken up to that time by any other state. In the decade following 1907, altogether there were 37 states (and the District of Columbia) which had established regulation of telephones. The movement was paralleled in Canada where the Board of Railway Commissioners was given power over telephone companies in 1908, the provinces of Ontario, Nova Scotia, Quebec, New Brunswick, and Manitoba, all established commissions before 1912. A number of cities in the United States also experimented with telephone regulation during this period, notably Kansas City, St. Louis, Los Angeles, Houston, and Wilmington, Del. In 1910 Congress gave the Interstate Commerce Commission power to regulate telephone companies.

Accounts.—The regulation of accounts has thus far been exercised by the Interstate Commerce Commission and this regulation accepted by the various state commissions. This system has been worked out through the cooperation of the American Telephone and Telegraph Company and the Interstate Commerce Commission. It has been in force now for over 15 years. The accounts of the various groups differ only in the amount of detail demanded and they all require such information as is well adapted to the purpose of the investor. The system calls for five general classifications of accounts, namely, balance sheet, plant and equipment, income, operating revenue, and operating expense accounts. These enable the commission to determine the profitability of operations and the amount of money put back into the property for the more intelligent control of rates and service. A majority of the state commissions are empowered to compel companies to keep accounts

according to some prescribed system and a few states, for example, Indiana and Michigan, require the accounting system to conform as closely as possible to the Interstate Commerce Commission requirements.

World Position of United States.—As in the case of telegraph companies, the United States leads all other countries of the world in telephones. The telephone, like the telegraph, is preeminently the American contribution to world communication. Statistics of leading countries are as follows:

TABLE 52.—TELEPHONE STATISTICS OF THE WORLD

Country	Miles of wire, thousands	Number of telephones, thousands	Telephones per 100 population	Telephone conversations per capita
United States	76,710	20,068	6.4	231
Canada	4,476	1,152	14.2	257
France	3,570	1,052	2.5	19
Russia	1,000	331	0.2	
Germany	12,845	3,182	5.0	40
Italy	990	381	0.9	
Great Britain and North Ireland	8,390	1,886	4.1	32
Argentina	895	279	2.5	
Brazil	452	159	0.4	
Japan	3,040	865	1.4	48

From *Telephone and Telegraph Statistics of the World*, Jan. 1, 1930

The United States has 60.03 per cent of all the miles of telephone wire of the world and 58.12 per cent of all telephones. Of all telephones 32 per cent are government systems and 68 per cent private. Of the latter, 85 per cent are in the United States. Intensity of telephone service is characteristic of countries which have private systems, New Zealand, Australia, Sweden, Switzerland, being important exceptions. Intensity of telephone service of leading cities of the world is as follows:

TABLE 53.—TELEPHONES PER 100 POPULATION, JANUARY 1, 1930

United States			
New York	26.3	San Francisco	40.8
Chicago	29.4	Washington	32.7
Los Angeles	30.2	Minneapolis	27.0
Pittsburgh	23.5	Seattle	31.3
Milwaukee	21.9	Denver	31.3
		Omaha	28.8
Foreign			
London	8.7	Moscow	2.9
Paris	12.5	Vienna	7.4
Berlin	11.9	Rio de Janeiro	2.9
Buenos Aires	6.5	Peiping	1.1
Tokio	6.0	Glasgow	4.7

Intensity of telephone development in the United States seems to be directly in proportion to the size of cities. In the 8 cities of over 1,000,000 population telephones average 25.4 per 100 population, in 10 cities with population from 500,000 to 1,000,000 there are 23.2 per 100; and in 32 cities of 200,000 to 500,000 population, there are 21.7 per 100 population. In communities of less than 50,000 population in the United States, there are over 12.1 telephones per 100 population. World statistics bear out this principle. In foreign countries communities of over 50,000 population show several times greater intensity than those under 50,000 population.

Gross Revenues—The outstanding characteristic of telephone revenues is their uninterrupted growth. In no single year since the American Telephone and Telegraph Company was organized have the revenues of the Bell System failed to show a substantial increase. In the main, this is accounted for by the steady growth in the number of telephones in use in the system. The influence of business cycles on operating revenues, however, is plainly visible in advancing receipts during periods of prosperity and retardation during years of depression.

TABLE 54—BELL SYSTEM STATISTICS

Dec 31	Number of telephones, thousands	Gross revenue, thousands	Average revenue per telephone
1905	2,284	\$ 97,500	\$43
1915	5,968	239,910	40
1920	8,333	461,134	55
1925	12,035	741,299	62
1926	12,816	823,216	64
1927	13,726	894,699	66
1928	14,524	975,426	67
1929	15,414	1,070,794	69
1930	15,682	1,103,939	70
1931	15,390	1,075,000	70

From Annual Report of the American Telephone and Telegraph Company, 1931

After 1915, however, the acceleration in telephone revenues as compared with the increase of number of telephones in use is pronounced. Between 1914 and 1924, average telephone rates of the Bell System increased 27 per cent, a modest amount, when compared with the increase in commodity prices and the cost of living¹. The table shows that the average revenue per telephone in use remained fairly constant until 1915 when it amounted to \$40 per telephone. The next 5 years saw an increase to \$55 per telephone, while 1930 showed an increase to \$70. The increase after 1915 is accounted for by the more favorable attitude

¹ *Bell Telephone Quarterly*, July, 1924

of the courts (particularly after 1920) and the increase in rates allowed by the commissions. It is also due to the advance in toll business during this period.

The revenues of the Bell System are divided into three divisions. First and most important are the revenues from local exchange service, second, toll revenues which are a composite of long-distance and local toll service, and, third, miscellaneous revenues from directory advertising, radio service, and so forth. The significant trend in revenues has been the relative increase from toll and miscellaneous sources. Revenues from the three sources since 1917 are as follows:

Revenues	1930, per cent	1922, per cent	1917, per cent
Exchange	66.2	68.5	70.4
Toll	31.5	29.8	28.6
Miscellaneous	2.3	1.7	1.0
Total	100.0	100.0	100.0

Toll and miscellaneous revenues together have advanced from 29.6 per cent in 1917 to 33.8 per cent in 1930. The revenues of the parent company come in part from contracts with the associated companies for the use of patents. Before 1902 a rental charge was the basis of compensation but in that year the charge was simplified and made $4\frac{1}{2}$ per cent of gross receipts of the associated companies. After long litigation this was approved by the Supreme Court and in 1926 the rate was reduced to 4 per cent. Revenues from this source are included as part of the operating revenues of the company.

Cyclical Influences.—General business conditions are not without their effect upon the telephone industry, although their influence is in some respects more difficult to trace than in any other industry, except water companies. In no year since 1900, except 1931, has the Bell System failed to increase the total number of telephones in service. Years of depression have resulted in interruptions to the upward trend. This is particularly true of 1908 and 1930. This latter year showed only about one-seventh the normal increase in number of telephones in use. The development of long-distance and toll systems has introduced an element of fluctuation in telephone finance. The toll conversations showed an actual decrease in 1908 and 1914. Nevertheless, 1930 showed an increase of 1 per cent over 1929. The depression of 1921 is hardly discernible in telephone statistics.

Seasonal variations are mild in the telephone business. The first quarter of the year shows a sag in operating results, while the increase

is gradual throughout the balance of the year, reaching the peak in December

Operating Expenses.—Operating expenses of the Bell System are classified into current maintenance, depreciation, traffic, commercial, and general and miscellaneous. The relative importance of these different items in 1930 was as follows

	Per Cent		Per Cent
Current maintenance	24 7	Commercial	13 7
Depreciation	23 5	General and miscellaneous	9 0
Traffic	29 1		
		Total	100 0

The two items of capital expenditure and current maintenance and depreciation accounted for 48.2 per cent of total operating expense in 1930. These items have shown a tendency to increase more rapidly than other items since the war. While total expenses increased 109 per cent from 1922 to 1930, expenses for maintenance rose 142 per cent and for depreciation 128 per cent. These results are doubtless due to the trend toward more efficient and costly apparatus and the declining importance of manual service in the telephone industry. The other side of the picture is shown by the relatively small increase of 48 per cent in traffic expenses, mainly composed of wages of operators. General and miscellaneous expense shows the largest advance in the period. In this item are included expenses for accounting, financial and legal departments, insurance premiums, sickness, accident, and death benefits, pensions, and so forth. Wages constitute about three-fifths of all operating expenses.

Depreciation Charges.—Rates of depreciation for telephone property vary according to authority from 15 to 20 per cent. Special cases may greatly exceed these limitations. The Bell System allows an annual depreciation charge of 5 per cent of the plant and equipment. Many smaller companies neglect depreciation altogether and their net earnings should be discounted in proportion. In the absence of action by the Interstate Commerce Commission, many state commissions have recently allowed depreciation at rates varying from 4.5 to 6 per cent.

Operating Ratio.—The operating ratio (before taxes) of the Bell System shows remarkable constancy. In 1917 it was 70 per cent, in 1922, 71 per cent, but it was back to 70 per cent in 1930. Such a showing can be made by only a few industries. The operating ratio (including taxes) of the American Telephone and Telegraph Company in the conduct of its long-distance lines was 82.4 per cent in 1930, the corresponding figures for the Bell System as a whole were 77.7 per cent.

Net Income.—In this item is sought a figure applicable to interest charges and dividends on stock. After deducting taxes, uncollectible

revenues, and rents for buildings, conduits, and so forth, from net operating income and after adding to the remainder non-operating revenues (including dividends and interest from Western Electric Company and from other subsidiaries, interest, and so forth), a figure applicable to capital earnings is arrived at. This figure amounted to \$268,000,000 in 1930 and was at the rate of 5.8 per cent on the cost of plant and other assets. Except for the war period, this figure has been remarkably constant.

Assets.—The assets of the Bell System are represented to the extent of 80 per cent by plant and equipment. Only about 2 per cent of total assets is composed of materials and supplies. The companies maintain a comparatively small cash reserve but a much larger secondary reserve, amounting to 7 per cent of total assets in 1930 and currently invested in marketable paper. Except for rate-making purposes and consideration of those who have furnished the capital for the development of the telephone business, the assets have little investment significance. The earnings of the property must always be the fundamental security behind telephone securities.

Capitalization.—On December 31, 1930, capitalization of the entire Bell System was as follows:

Class of security	Amount, millions	Percentage of total capitalization
Common stock of the American Telephone and Telegraph Company	\$1,795	
Common stock of the associated companies (publicly owned)	137	
Total common stock	1,932	61.3
Preferred stock of associated companies (publicly owned)	110	3.4
Mortgage bonds of associated companies	559	
Collateral trust bonds of American Telephone and Telegraph Company	77	
Convertible bonds of American Telephone and Telegraph Company	12.9	
Debentures and notes of American Telephone and Telegraph Company	383	
Debentures and notes of associated companies	82	
Total bonds and notes	1,113.9	35.3
Grand total	\$3,155.9	100.0

The total bonded indebtedness of the Bell System is only 35.3 per cent of the capitalization in the hands of the public and only 27.8 per cent of the value of plant and equipment. From the standpoint of earnings the situation is equally favorable. In 1922 bond interest was earned

3 4 times over and in 1930, a year of depression, it was earned 4 times over. No important industry can better this financial record. The conservative issue of bonds and the steady earnings place telephone securities in a class by themselves.

Bond Issues.—In the earlier history of the consolidation movement, telephone companies issued a considerable number of collateral trust issues. Most of these have fallen due since then and have been replaced by straight debenture issues or in some cases by mortgage bonds of fairly uniform character. The collateral trust bonds formerly issued by the American Telephone and Telegraph Company provide basic standards of present issues. They provided for the deposit of collateral composed of the stocks of associated companies, for the most part, whose value at all times was to be maintained at $133\frac{1}{3}$ per cent of the collateral issue outstanding. The outstanding issue of the present time, due in 1946, provides for a moderate sinking fund for the purchase of bonds at 105 or less. The issue itself is redeemable at 105 and interest.

Debentures.—These are issued mostly by the parent company and are protected by provisions which require that, if any of the telephone property is mortgaged, the debentures shall be secured by deposit as collateral stocks or bonds of associated companies to the extent of $133\frac{1}{3}$ per cent of the debentures outstanding. Moreover, no collateral of telephone operating companies can be pledged without ratably securing outstanding debentures to the extent of $133\frac{1}{3}$ per cent of outstanding issues. The company from time to time issued convertible bonds at a ratio which has proved profitable to the purchasers. Debenture bonds have been issued also by certain of the associated companies, notably the New England Telephone and Telegraph Company. These were protected by a provision requiring ratable lien on property of the company in case mortgage bonds were subsequently issued. Two of the issues (maturities in 1930 and 1932) subsequently became mortgage bonds when the company in 1932 issued first-mortgage bonds on the property.

Mortgage Bonds.—Where the associated companies directly own property, they have in several instances issued first-mortgage bonds of the serial type with the usual discretion allowed as to rate of interest on the respective issues. The New England Telephone and Telegraph Company and the subsidiaries of several associated companies have first-mortgage bonds outstanding. The usual type of mortgage bond, however, is the first and refunding, or first and general mortgage. The fundamental security of these bonds is the same as in the case of the simple first-mortgage bond. They make provision, however, for additional issues of the same lien. In one case additional bonds may be issued if the total mortgage bonds do not exceed the amount of the capital stock plus the surplus, except in the case of new construction, when

bonds may be issued for 75 per cent of cost of construction. The more usual provision, however, is to limit bond issues to twice the capital stock and, when they exceed the amount of the capital stock, only 75 per cent of the cost of new improvements may be covered by mortgage bonds and then only if the interest rate on all indebtedness during 12 consecutive months out of the preceding 15 months has been earned $1\frac{3}{4}$ (in one case $1\frac{1}{2}$) times over.

The bonds of the Bell System are legal investments for savings banks in many states. Here as usual, however, technical requirements of some of the more fastidious states exclude some of the best issues and it is impossible to make a statement to which no exceptions are found. In general it may be said that most of the first-mortgage bonds are eligible in most of the states having laws on the subject including New York and Massachusetts, the two most fastidious states. Practically all of the bonds are legal in some states for savings banks or trust funds. These bonds are generally listed on one or more important exchanges of the country, so that they are highly marketable securities.

Preferred Stock.—A few companies, the Bell Telephone Company of Pennsylvania, the New York Telephone Company, and the Chicago Bell Telephone Company, all have rather sizable issues of preferred stock, although they form a comparatively small percentage of the total capitalization of the respective companies. These issues carry a cumulative dividend rate of 6.5 or 7 per cent per annum and are otherwise featureless, except for inconsequential contingent voting rights. They are available on some of the more important exchanges of the country.

Common Stock.—Common stocks of the associated companies have mostly been acquired by the parent company, so that only \$137,000,000 now remain in the hands of the public. Most of this amount consists of over two-thirds of the stock of the Bell Telephone Company of Canada and a minority of the stock of the New England Telephone and Telegraph Company. The stock of the former company has paid dividends each year since 1881, the rate since 1891 being \$8 per annum. The New England stock has paid a dividend each year since 1886 at varying rates. It is the policy of both companies to leave only a small margin of earnings on the average as surplus. Only the constancy of telephone revenues would permit such a policy.

The principal interest in telephone stock centers in the common stock of the American Telephone and Telegraph Company, the parent company. This is an exceptionally conservative issue, considering the character of the telephone industry. It is preceded by a modest amount of bond and stock issues. Consolidated surplus and reserve account, all of which is invested in telephone property, amounted to 70 per cent of the outstanding stock in 1930. Earnings on the average amount of stock outstanding since 1922 were as follows.

Year	Per Cent	Year	Per Cent
1920	11 72	1926	11 95
1921	11 10	1927	11 76
1922	11 14	1928	12 11
1923	11 35	1929	12 67
1924	11 31	1930	10 44
1925	11 79	1931	9 05

The American Telephone and Telegraph Company and its predecessors have paid dividends on the common stock for approximately 50 years and never at less than \$7 50 per year. From 1900 to 1905, the rate was \$7 50 per annum; 1906-1920, \$8 per annum; 1921, \$8 50, and 1922 to date \$9 per annum. The policy of the company as regards dividends received formal statement in the *Annual Report* for 1927 in the following terms:

It is the policy of the company to pay only reasonable regular dividends and, for part of the new capital needed, to offer from time to time new stock to its stockholders on favorable terms, for it believes this method of financing will provide the money needed for the business cheaply and with more certainty in good times and bad than any other.

The company has frequently offered subscription rights to its stockholders at par when the stock was selling at a substantial premium.

The common stock has a wide market, being listed on the important American exchanges and also on the London Stock Exchange. It stands near the top of stocks favored by investment trusts. At the close of 1931, the company had 642,000 stockholders, over 100,000 of whom were employees of the Bell System. The average amount of holdings was 32 shares each but no single individual owns as much as 1 per cent of the total stock. The character of the stockholders is further shown by the fact that at the end of 1928, out of a total of 454,596, there were 431,373 with less than 100 shares each, while 164,370 had less than 5 shares each. Eighty per cent of all holders had less than 25 shares each. Stockholders are found in every state in the union and in a number of foreign countries. Almost one-half of the stock has been held in New England. The broad ownership of the stock attests the universal esteem in which it is held.

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CHAPTER XXVI

INDUSTRIAL SECURITIES

The term "industrial securities" is used in a rather loose sense to designate the security issues of business concerns not included in railroad or other public-utility classifications. Industrial concerns, for the most part, are engaged in producing or trading in commodities rather than in rendering services. They operate in the field of free competitive enterprise and constituted the subject matter of the classical and later economists in the formulation of their doctrines of value and price, interest, wages, profits, and international trade. In these matters the investor has the greatest need for a thorough acquaintance with fundamental economic laws and processes.

Rise of Industrial Securities.—Modern industrial financing in the United States is a product mainly of the past 30 years. Before 1900, most industrial concerns were close corporations, their securities not being widely distributed. Nevertheless, even a decade before this time there was a large number of substantial industrial concerns whose stockholders were widening in numbers. As early as 1885, the New York Stock Exchange created the "unlisted department" for the accommodation of customers seeking speculation in industrial stocks. Some of the soundest of present-day industrials are to be found among those appearing in this department at that time. Bonds were then practically unknown among industrial corporations, although certain types of industrials floated notes and temporary obligations in emergency financing. These concerns, therefore, were compelled to finance their own undertakings out of earnings; when this source failed, the stockholders were solicited for the purchase of additional shares.

Industrial securities, however, did not appear in large amounts until the time of the consolidation or trust movement at the end of the nineteenth century. It has been estimated that, up to the end of 1897, the total combinations in the industrial field amounted to only 92 in number, involving a capitalization of about \$1,584,000,000. The number in the 5 succeeding years, however, was 153, with total capitalization of \$7,710,000,000.¹ These securities were admitted to the unlisted department of the New York Stock Exchange in great quantities, amounting to \$2,808,000,000 in 1902. So great was the amount of new industrials that they have been assigned as a primary cause of the rich man's panic of 1903 with its mass of "undigested" securities.

¹ LUTHER CONANT, *American Statistical Association*, Vol. 7, No. 53, pp. 207-226

During all this time, however, and for 7 years afterwards, industrial securities were regarded as too speculative to be admitted to the listed department. On the other hand, railroad and government issues were referred to as "investment" securities. This condition, however, did not continue long. Industrial securities continued to be poured upon the market in great volume, until in 1921 the amount listed upon the New York Stock Exchange that may thus be classed totaled \$10,-279,000,000. This class of stocks for the first time exceeded in amount those of any other class, even passing railroad listings. The relative importance of the leading classes of securities listed on the Exchange, February 1, 1932, may be seen in Table 4.

Industrial Competition—The fact of competition is one of the most potent forces in industrial securities. Some few industrial corporations have a monopoly secured through control of the supply of raw materials, as The International Nickel Company, for instance. Others have a monopoly, or near monopoly, through the control of patents, trademarks, copyrights, and so forth, as, for instance, the United Shoe Machinery Company. While these companies are free from competitive influences, the great majority of American corporations are profoundly affected by actual or potential competition.

Actual competition frequently goes to the extent of cut-throat competition. The effort to drive competitors out of business and thereby secure some measure of monopoly through restriction of numbers has often led to cutting of prices below the cost of production, with the hope of future profits through the elimination of the unfit.

Contrary to popular impression, the tendency in industry is largely toward maintenance of competition instead of creation of monopoly. The monopolies once feared through the United States Steel Corporation and the Standard Oil Company are little heard of today. It can safely be assumed that actual tangible monopoly is on the wane, and that with few exceptions this force cannot be depended upon as of abiding advantage in industrial securities. Nevertheless, the real benefits in price control that were aimed at in the past in monopoly are fast being attained through other means. The community of interests discernible among the owners of the independent corporations has often created a common understanding as to the most effective policy for all concerned. The better business morality, strongly in evidence in recent years, will go far toward securing the benefits once sought through monopoly.

Analogous to community of interests is the influence of the many trade, manufacturing, and credit associations. A common ground for meeting is found among competitors in recognition of the common interests of the trade. The most effective policies as to price, labor, credit-granting, legislative measures, and so forth, are learned from personal contact as well as from trade magazines. In this connection

may be mentioned, also, the local commercial clubs and chambers of commerce loosely affiliated in the United States Chamber of Commerce with headquarters in Washington, through which policies and activities are gradually becoming unified and standardized. The results of all these efforts should be greater stability in business and a firmer foundation for industrial security values.

Industrials in Receivership.—It is seldom that a railroad is abandoned, its property is essential to the maintenance of the community or district. Reorganization is generally the worst that can happen to failures in these classes of corporations. Far different is the position of the industrial corporation. While the products placed upon the market may be a prime necessity of living, nevertheless the community is not dependent upon a particular property in providing these commodities. It, therefore, comes about that when failure results and the courts come to deal with the corporation in receivership, if the corporation is of small or moderate size, the property is more than likely to be liquidated for the payment of the debts. Large corporations that hold a commanding place in the industry are not so readily liquidated but more often will be reorganized. An industrial corporation that must be liquidated will probably rescue only a small part of the investment with which to pay the debts, leaving little or nothing for the stockholders.

Substitution of Product.—If one views the products of industrial concerns as a whole, they may be said to be quite as necessary as the services of utilities. But the investor does not deal with industrial concerns *en masse*. He must be able to gauge the market for the various products which have to compete against substitute commodities. His knowledge of human nature, what the consuming public will demand tomorrow and in the years to come, will put him in possession of essential information. The products of today are not the products of yesterday nor will they be the products of tomorrow. With industrials as nowhere else, dynamic economics has especial significance. This means ceaseless change in the variety of new products constantly being placed before the consumer who himself is subject to inscrutable psychological laws. Fashion, taste, social conventions, and customs dictate to a large extent the expenditure of a mercurial public pampered by the richness and lavishness of a country unparalleled in economic resources.

Changes in the technique of production are even more rapid than in the variety of consumers' goods. They eventuate in a better product for the consumer or in a lower cost of production and hence a lower price. Changes in the technique of production continuously render machinery already in use obsolete. Competition of new concerns or older ones that have no hesitancy in scrapping obsolete machinery and processes in favor of more up-to-date and less costly methods of production soon drive from the field those less progressively inclined.

There are to be found today old concerns bravely struggling to keep up their past tradition but woefully short on accomplishment, simply because the controlling force in the organization bows at the altar of precedent. Ruin is the inevitable result of such a policy.

Obsolescence of Product.—Obsolescence of product need not wreck an industrial concern, it may be the golden opportunity for it to forge ahead. The modern industrial organization must be prepared technically, financially, and otherwise to take advantage of all opportunities to supply the purchaser with the products demanded. At every turn it will render new equipment necessary and perhaps new methods of marketing, but these constitute progress. The stimulation derived by both the public and the producer from the creation and marketing of new products is basic to progress itself. It shakes off the dead hand of routine and monotony and creates a mental cerebration necessary to success. New products are the bone and marrow of economic progress. Progressiveness of industrial management not only demands that the concern keep up to date but goes further and requires that the successful concern be a leader in the course of progress. It must be constantly experimenting in the research laboratory on new products and devising new methods of contact with the consuming public. The public is, after all, conservative in its outlook and new products require the expenditure of large sums of money in marketing to remove skepticism.

Classification of Industrial Corporations.—While certain characteristics are common to all industrial concerns, it is nevertheless desirable to classify them into various groups based upon certain features that distinguish each group. The market place itself has proceeded far in the process of classification. It is recognized here that no one system of classification will serve all purposes. But the following is suggested as a classification that meets fairly well the needs of logical treatment and conforms closely to the facts of the market.

- I Industries producing raw materials (1) coal and coke; (2) nonferrous metals, copper, lead, zinc, and silver, (3) gold, (4) oil producing, (5) lumber, (6) wood, pulp, and paper, (7) brick, stone, and cement
- II Manufacturing concerns
 - A Industries serving producers only (1) agricultural implements, (2) machinery and tools, (3) office equipment; (4) steel and iron
 - B. Industries serving consumers only (1) textile and clothing, (2) food products, (3) household products, (4) leather and shoes, (5) notions, (6) hotels and restaurants, (7) publishing
 - C. Industries serving both producers and consumers (1) automobiles and accessories, (2) building and construction; (3) chemical industry; (4) equipment industry, (5) oil producing and refining, (6) rubber and tire
- III. Trading concerns (1) grocery, (2) department stores, (3) notions, (4) drugs; (5) specialty shops, (6) mail order, (7) chain stores.

The producers of raw materials are engaged in the extraction of natural resources whose supply is limited. These industries must con-

stantly be on the search for additional sources of supply. They must also make adequate provisions for the conservation of their capital, since wasting assets deplete their fundamental property and render economically useless their entire equipment. Amortization of some description must be adequately provided for.

The products of this group of industries are subject to sudden changes in utilization and price. Where materials are limited there may be an element of monopoly in this type of industry. On the other hand, potential competition of the most destructive kind always lurks in the possibility of discovery of new sources of supply. Especially is international competition likely to be keen. The copper industry has passed through many phases of monopoly and competition. At the present time many American mines are rendered unprofitable through the development of South American mines, with those of Africa in the offing.

The oil-producing industry has been subject to perhaps even worse fluctuations. Only a few years ago the geologists were dogmatic in their assertions concerning the near-exhaustion of oil resources. But the rotary process of deep drilling and discovery of new oil-producing areas have completely changed the picture to one of overproduction until the integrity of the securities in this field depends upon artificial methods of restriction. But pooling and agreements in any form have seldom proved effective in the past. Moreover, there are the various anti-trust laws of the states and federal government which at any time may render all their efforts nugatory.

For violent fluctuation in price the rubber-producing industry is perhaps the outstanding example. The automobile industry developed such a demand for rubber that the old sources of supply were soon supplemented by new ones in many parts of the world. Vast plantations were developed, until rubber became a drug on the market and the producers threatened with ruin. Thereupon came the British restrictive policy which temporarily boosted the price of rubber many fold. But monopoly was not complete and rubber plantations were being developed by certain American companies that threatened the monopoly of the British and Dutch companies. Restrictions were promptly removed with the result that the price of rubber sank to only several cents per pound, a figure well below the cost of production.

Other raw-material industries have fared little, if any, better. The coal-mining industry has suffered chronically with overproduction and low prices. Sugar companies prospered before the war, but with the skyrocketing of prices the sugar-producing areas were vastly expanded and, owing to their inability to contract production, prices have for over a decade remained generally below the cost of production. Practically every kind of raw material is subject to such uncertain fortunes as the industries cited.

Manufacturing Concerns.—The usual process of manufacture consists in transforming raw materials or semi-fabricated products into marketable products. In this process a certain value is added by manufacture. The total cost of manufacture is made up of cost of primary materials, plus wages and salaries, taxes, and capital costs. Among the many uncertainties of manufacturing industries, the cost and acquisition of raw materials in the amounts and at times when needed stand out prominently. The remaining costs are more or less constant and vary only with the quantity produced. The manufacturing industry which depends on raw materials for its materials of manufacture is obviously in the most uncertain position, since it is subject to changing conditions in the raw-material industry.

The finished products of manufacturing companies are generally subject to far less fluctuation in price than raw materials. Unless protected by patents, trademarks, copyrights, future contracts, and the like, manufacturing companies are especially subject to competition, either actual or potential. In proportion as competition is keen, the industry will be reduced to a comparatively unprofitable existence.

The policy of protection has special significance to the manufacturer. In the international competitive struggle this policy tends to preserve the home market for home industry, so that international trade tends to be more and more a struggle of the industrial countries for the markets of the less well-developed countries. As a rule, the latter are the sources of a large proportion of the raw materials that find their way into international trade.

Industries serving producers are mostly engaged in furnishing equipment of some sort which in turn is used to advance the stage of manufacture one step further on its way to the consumer. In addition to serving concerns manufacturing directly for the consumer, they also supply equipment and goods to the railroads and public utilities, as well as to the farming industry, to financial and real-estate interests, and to state, local, and federal governments. The demand for the products of this group is characterized by great change and violent cyclical fluctuations. New industries spring up in periods of general prosperity and demand enormous quantities of equipment. To this new and sudden demand is added the demand from industry in general in order to extend facilities to supply a prosperity demand for their products. On the other hand, a sudden falling off of demand occurs when business declines and depression sets in. The result is great fluctuations in the fortunes of this group of industries. In addition, obsolescence of their equipment is a constant danger. Competition always threatens to displace their products through better and more economical ones. The industries serving producers, moreover, must meet competitors on purely economic grounds. The single condition on which they must meet is one of costs. If a progressive producer

is convinced that his machinery is uneconomical and therefore obsolescent, he will go to the limit in the process of rehabilitation. He is forced to this by the certain competition that will eventually materialize

Some of the industries of this group are basic to industry in general, that is, they are at the beginning of the chain of manufacturing processes, since they furnish materials for the producers of equipment themselves. Such is the iron and steel industry, which furnishes a variety of materials for the manufacture of equipment, machinery, and tools and in addition serves the construction and building industries. On the other hand, the railroad equipment and machine tool manufacturing companies are subject to much greater fluctuations in their affairs. Certain others, possessing some element of monopoly and threatened with less potential or actual competition, such as agricultural-implement concerns, are able greatly to reduce the uncertainties in production and prices of their products. This is due partly to a certain monopolistic element in their business, but more from the fact that their ultimate market is composed of unorganized farmers whose individual demand is too small for effective buying.

Some of the characteristics above mentioned apply also to the office-equipment industries. Office equipment expands as prosperity increases and contracts as depression appears. Offices are opened by new business concerns and agencies bent on getting their share of prevailing prosperity. On the other hand, the new type of office equipment aims at economy of operations instead of business routine. This type of equipment saves the labor of many clerks and is likely to be introduced during periods of depression. Such are the labor-saving devices of the International Business Machines and Addressograph companies.

Industries Serving Consumers.—In a sense all industries serve consumers. The economist points out that the industries above described represent only one stage in the process of producing consumers' goods. But the industries operating at the first stages of production have characteristics which distinguish them from the industries which serve consumers directly. Producers' equipment may undergo a complete revolution in technique and require unusual amounts of capital, while the product ultimately emerging for the consuming public may be little changed. For example, shoes not unlike the present article have been worn for centuries but the craftsman with his simple tools has been replaced by costly labor-saving machinery and equipment. So, too, homespun clothing was not very different from certain fabrics at the present time, but the old spinning machine and handloom are now relics of a bygone era. There is in fact scarcely an industry which has not undergone a radical revolution in its technical equipment within the past 50 years. Changes of this sort are vital for the producers of equipment serving the industries more directly in touch with consumers. They also

affect those that are serving consumers directly, while leaving their products unchanged. Consumers need not be aware of such industrial changes, since the products in which they are interested may escape change entirely.

Industries manufacturing commodities for direct consumption are affected first and foremost by considerations relative to public demand, that is, market conditions and competition among producers. Constant watchfulness for market trends is a main concern of this class of producers. They manufacture for a known demand which is always subject to change without notice. Here refinement of product and ceaseless change in detail are the order of the times. Most fortunate is the producer who not only is able to follow the shifting demand but is in a position to create the demand himself. The successful producer who has caught the public fancy is immediately confronted with a whole host of imitators whose combined production soon "spoil" the market, leaving little or no profit for any. At this juncture rescue can only be effected by bringing about another change in the creation of a new product. This is the endless round of many producers catering to consumers.

Examples of the phenomenon here in mind will readily occur to the reader. The development of the rayon industry with its destructive effect upon the financial affairs of other textile industries is a matter of public knowledge. So the present adoption of the electric refrigerator on a large scale sees the ice-manufacturing industry melting away, while progressive managements endeavor to extricate themselves by adding to their operations the manufacture of ice cream and other notions. Much the same may be said of the aircraft industry in its present stage of development, the radio with television in the offing, cosmetics and tooth paste, razor manufacturing, and an endless catalogue of household products.

Careful search may, however, uncover industrial concerns not bothered by imitators and competitors. They are serenely entrenched behind half a century of good-will or perhaps protected by ancient trademarks, with their indelible impressions upon the uncritical public mind. Royal Baking Powder, Quaker Rolled Oats, Arm and Hammer Brand Soda, Fleischmann's Yeast, and the like—will these ever loosen their grip? Maybe, even tomorrow, or next day. The ranks of this army begin to appear somewhat serried. Who knows but that tomorrow they will be shattered? Witness the struggle of Chase and Sanborn Coffee, Williams' Shaving Soap, Arrow Brand Collars, Gold Dust Cleansing Powder, and so forth.

Industries Serving both Producers and Consumers.—Certain industries serve both producers and consumers, such as the automotive industry and its accessories, rubber and tire concerns, and the oil, chemical, and building industries. The fact that their market is broader and more diverse lends strength and stability to their operations. The truck

supplements the passenger automobile in the manufacturing process. So the market for tires, partly for new cars but mostly for replacement among owners of both trucks and passenger automobiles, acquires relative strength and permanence. The many kinds of lumber and building materials, not to say metals used in the building industry, serve the residence-construction industry, the office and industrial plant, the building of roads, and engineering works of varied description. The result is increased permanence and stability of operations. However, like most other industrial concerns, these are profoundly affected by competition and are exposed to the recurring temptation of overextension of capacity in periods of prosperity.

Trading Companies.—The operations of trading concerns are confined mostly to the field of wholesale and retail merchandising. They are situated close to the consumer and perhaps their chief problem is the gauging of consumer demand. They must "keep their ears close to the ground" and be ever on the alert in detecting changing wants of the consumer and if possible assume some responsibility perchance to direct these wants through clever advertising and window displays. The retailer's task is simplified by the fact that the market is circumscribed by local conditions. Under certain circumstances this is a weakness, as in the case of seasonal articles such as rubber wear, straw hats, and hot-weather clothing. The impossibility of foretelling the character of the season leads to many mistakes in gauging demand and results in sacrifice sales. Perhaps the largest portion of retail commodities, however, is not subject to violent fluctuations in demand and the merchant who has reasonably good judgment and does not lack experience will find little difficulty in supplying his customers with just the articles called for.

On the whole, the problems of the retailer are comparatively simple and, if his merchandise is of the standard-brand type, his operations fall little short of routine character. Given pleasant relations with customers, concerns of this kind, such as grocery stores, operate almost automatically, in fact so much so that only cashiers and placement clerks are needed. The stability of the demand for consumption articles at retail and the ability of the retailer quickly to change his stock to suit changing demands are the strongest features of retail and wholesale trade.

Income.—The operations of industrial corporations are essentially the buying, manufacturing, and selling of commodities with a spread between the cost and the price received. This margin of profit is perhaps the most fundamental fact in earnings of industrial concerns. The factors which govern the amount and stability of earnings are (1) the cost of the commodities plus additional expenses for manufacture or handling, (2) the sale price, and (3) the volume of trade.

The most common causes of fluctuating earnings are changes in cost or sale price. These occur (1) from conditions affecting individual com-

modities, such as changes in demand and supply relations and cost of production, and (2) from cyclical fluctuation in average commodity prices. Permanent changes in cost of production within the past decade have resulted from an unprecedented advance in the wage scale. This fact has had profound influence upon the course of industry. Decreasing profit margins have been combated most successfully in the manufacturing field where greatest opportunity for technical improvements exists. The substitution of machinery for labor has been one of the outstanding facts of industry since the war. In the production of raw materials, less success from this source is possible, since costs are to a large extent fixed by natural conditions affecting the extraction of each commodity. Even less is it possible to offset decreasing profit margins in trading concerns where little or no technical improvements in equipment are employed. All have attempted to offset declining profit margins through increased volume of business. This has brought to pass a new era of consolidation. It has intensified sales and advertising campaigns. Orderly competition among relatively few strong units has displaced the less orderly competition of the many against each other.

Gross earnings of industrial concerns are derived from three important sources, namely, (1) industrial operations, (2) investments, and (3) non-recurring profits on sales of capital assets. Analysis of income from operations is the fundamental problem of the investor. Income from the other sources, however, must receive especial attention.

As essential as gross earnings are to the determination of the credit position, it is a lamentable fact that even today gross income of the majority of industrial corporations is not published. Perhaps this is due to the doubtful success of many of these concerns. Small concerns in particular often report, even to their stockholders, nothing more than balance sheet items and perhaps net earnings available for dividends.

Importance of Trend.—With industrial corporations more than with any other class, the trend of earning is of paramount importance. Industrial concerns seldom stand still, they move either backward or forward. There is no better index to the financial condition of an industrial organization than the trend of the net earnings. If the organization is losing ground, it is a sure indication of approaching calamity to either the stockholders or bondholders. It is more than probable that the management has failed to measure up to competitive requirements. Where this is the case, the only remedy is the utter casting out of those in control. A management having once shown itself to be feeble but still clinging to coveted control is the most hopeless calamity that can befall an industrial enterprise.

A decline in gross over a number of years, while competitors show an upward trend, reveals a condition of certain decay. No matter how efficient the concern is as an operating unit, if the products cannot be

disposed of the organization is doomed. On the other hand, if gross earnings are pushed ahead at the expense of an extravagant sales policy, resulting in the net earnings losing ground relative to gross, the concern is more than likely headed for the rocks. Likewise, a management that expands plant capacity in order merely to make a place for itself in the sun, regardless of the effect of such a policy upon net earnings, is guilty of financial aggrandizement. It must never be forgotten by those in control of industry that the chief reason for the existence of any corporation engaged in business is the ability to show results on the capital invested. Any other result will sooner or later prove disastrous. Bond houses interested in the sale of securities of industrial enterprises frequently give only the average earnings. As pointed out in another connection, although average earnings may be satisfactory, the business may in reality be on the decline or stationary.

Margin of Profit.—In industrial finance the term, "profit margin" is made the basis of analysis instead of its complement, operating ratio. The study of profit margins is most fruitful and at the same time a much neglected source of information. A study of profit margins in 1926 and 1927 for 235 leading corporations distributed over all fields of industry was made by Lawrence H. Sloan.¹ The aggregate result showed that in 1926 corporations saved 9.75 per cent of gross after deducting operating expenses, depreciation, and taxes (but not interest), and in 1927 they saved 9.12 per cent. Yet within the group extremely wide variations are found, the lowest being a deficit of 22.90 per cent in 1927, and the highest a profit of 41.70 per cent of gross. Of these companies, 26 showed profit margins averaging for the 2 years between 20 and 41.40 per cent of gross, 64 showed profit margins from 10 to 20 per cent, 123 had average profits between 0 and 10 per cent, while 22 had average deficits for the 2 years.

The 50 companies showing the highest profit margins were well distributed over a wide range of activities. Sugar, food, household products, and oil concerns were most prominent. It was revealed that high profit margins were due principally to the presence of one or more of four leading causes, namely, size, monopolistic characteristics, production costs, and selling prices of goods. It was discovered that the large profit margins were associated with the largest companies and that, as volume of sales increases from year to year, profit margins increase. Monopolistic elements included geographical location, patents, trade names and brands, good-will, and the like. The greater the control, the greater the profit margin. The economies of large-scale production tend to reduce costs, while price remains unaffected and so increases the profit margin. Reduction of costs in manufacturing are more under control of the management than in the extractive industries. Large corporations have better control over selling prices than small concerns and if, in addition, some element

¹ *Corporation Profits*, Chap. V

of monopoly exists price is subject to even greater control. It is the conclusion of the author of *Corporation Profits* that average profits will be higher where prices are relatively stable, price advances produce temporarily high profits only to be followed by correspondingly greater deficits. Only a few of the 71 corporations with profit margins of $5\frac{1}{2}$ per cent or less in 1927 were leaders in the field and generally small companies showed small profit margins. A slump in annual gross income is commonly accompanied by a reduction in the profit margin because costs are comparatively rigid. "Costs and prices are the most active variables in the profits equation."¹

Profits are not dependent upon high margins alone. Volume and stability of prices frequently offset any disadvantages in profit margins and the concerns showing these characteristics may be highly profitable. However, the trio of volume, stability, and high profit margin produces the most favorable situation.²

In the United States Steel Corporation for the years 1920-1925 wages accounted for 44.71 per cent gross receipts, general expenses 34.36 per cent, depreciation 4.84 per cent, taxes 5.16 per cent, interest 2.85 per cent, leaving 8.07 per cent for the stock. In 1929 wages accounted for only 38.34 per cent of the gross dollar, general expenses 29.68 per cent, depreciation 5.92 per cent, taxes 5.15 per cent, interest 1.40 per cent, leaving 18.51 per cent for stock. The stockholder profited relatively at the expense of wages, general expenses and interest, while depreciation increased.

Earnings on Invested Capital.—The best measure of success of an industrial concern is the percentage of earnings (after operating costs, depreciation, and taxes) on the amount of the capital invested. Sloan³ calculated this ratio for 1926 and 1927 on 544 leading industrial corporations. Invested capital was taken as the sum of balance sheet items of the par or stated value of all securities outstanding, plus surplus, less appropriated surplus or reserves. On the total capital invested (over \$25,000,000,000) total earnings were $10\frac{1}{2}$ per cent in 1926 and 9 per cent in 1927. Earnings by industries in 1927 were as shown in Table 55.

The ratio is relatively high in industries dealing in nationally advertised or trademarked products whose production requires comparatively little capital. On the other hand, companies dealing in electrical equipment and agricultural implements, requiring large amounts of fixed and current assets, make a poorer showing. Great volume and rapid turnover in tobacco products and retail trade overcome a narrow margin of profit and result in a creditable showing. Small earnings are shown in the case of large investment of capital in proportion to sales and in depressed industries.

¹ *Ibid.*, p. 108.

² For these general observations, see *Corporation Profits*, pp. 86-113.

³ *Corporation Profits*, Chap. VII.

TABLE 55—PERCENTAGE EARNINGS ON INVESTED CAPITAL, 1927

Drugs, etc	22	Copper	7
Automobiles	20	Railroad equipment	7
Office supply	16	Meat packing	5
Shoes	16	Steel	5
Food products	15	Oil	5
Chemicals	12	Paper	5
Tobacco	12	Sugar	5
Radio, etc	12	Coal	1
Electrical equipment	11	Leather	1
Agricultural equipment	10	Woolen goods	1
Auto tires	8	Fertilizers	1 (deficit)

A close relationship seems to exist between the margin of profit and earnings on invested capital. The 50 concerns having the widest margin of profit showed earnings of 18.5 per cent on invested capital in 1927. Forty-seven companies with profit margins between 0 and 5½ per cent earned 5.1 per cent on invested capital. Notable exceptions are found in retail trade and meat packing, where small margins are compensated for by large volume. A further point, escaping the notice of Sloan, is that by industries and in their totality the margin of profit and the rate of return on invested capital are almost identical.

Great differences between companies in the same industries are very striking and on their face defy explanation. In the drug industry, for example, the Lambert Company showed average earnings on invested capital for 1926 and 1927 of 171.45 per cent, while the American Druggist Syndicate showed only 4.39 per cent, Nash Motors averaged 54.05 per cent, while Graham-Paige showed average deficit of 15.25 per cent. Thorough analysis of each company is necessary to determine the causes of these differences.

Influence of the Business Cycle.—The influence of the business cycle on the net return of industrial corporations may be observed in a tabulation of earnings of 1,302 concerns for the 2 years 1929 and 1931 (page 509).

In 1929 no net income was reported by about 8 per cent of the concerns, whose combined deficits amounted to \$68,000,000, in 1930 there were 23 per cent with deficits of \$227,000,000, while, in 1931, 41 per cent showed deficits of \$533,000,000. In 1931 there were 143 companies reporting higher profits than in 1930, while 38 companies showed profits instead of deficits, and 120 operated at a smaller deficit than in the previous year. All together 301 companies improved their earnings in 1931 over 1930. They were mostly in the specialties class rather than in basic industries.

Depreciation Policy.—American industrial concerns are said to be without a depreciation policy. And it must be said that observation of published statements of leading corporations does not inspire confidence in the accuracy of earnings statements. In fact few statements can be

TABLE 56—SUMMARY OF BUSINESS PROFITS FOR THE YEARS 1929 AND 1931

Net profits are shown after depreciation, interest, taxes, and other charges and reserves, but before dividends. Net worth includes book value of outstanding preferred and common stocks and surplus account at the beginning of each year.

(In thousands of dollars)

Number	Industry	Annual net profits fiscal years		Percentage change 1929-1931	Percentage return on net worth	
		1929	1931		1929	1931
13	Agricultural implements	\$ 75,659	\$ D-8,057		14 3	
17	Amusements	42,077	11,713	-72 2	17 0	3 9
28	Apparel	21,439	D-2,994		12 5	
26	Automobiles	355,908	67,114	-81 1	22 0	4 0
48	Auto accessories	68,212	D-331	..	19 7	
16	Aviation	21,288	4,980	-76 6	14 7	3 0
18	Bakery	52,882	40,489	-23 4	15 1	11 0
44	Building materials	56,285	D-38		8 7	
28	Chemicals	204,973	115,081	-43 9	18 0	8 0
20	Coal mining	20,875	6,787	-67 2	3 4	1 1
15	Confectionery and beverages	42,805	38,114	-11 0	25 0	20 8
42	Cotton mills	11,561	D-16,128		3 3	
9	Dairy products	47,690	43,240	- 9 8	20 8	12 2
21	Drugs and sundries	79,977	75,888	- 5 1	21 9	15 6
47	Electrical equipment	175,284	47,911	-72 7	19 2	4 1
6	Fertilizer	5,295	D-1,239		4 0	
39	Food products—miscellaneous	120,010	70,396	-41 3	15 3	8 4
6	Furniture	2,128	D-4,704		4 5	
13	Hardware and tools	16,724	D-8,300		15 7	
22	Heating and plumbing	52,844	D-8,777	.	34 8	
37	Household goods	35,093	5,078	-85 5	13 2	1 8
57	Iron and steel	409,721	D-22,220		11 2	
12	Laundry and cleaning	2,698	1,798	-33 5	13 3	8 4
10	Leather tanning ¹	D-8,276	D-5,478		4 9	
9	Lumber	1,710	D-3,168			
72	Machinery	78,116	D-9,879		13 7	
18	Meat packing	36,586	D-8,528		5 4	
43	Merchandise, chain stores	122,556	97,448	-22 7	19 3	12 7
27	Merchandise, department stores	35,818	2,615	-92 7	10 5	0 7
6	Merchandise, mail order	44,988	D-24		14 4	
12	Merchandise, wholesale, etc	8,775	D-3,421		7 6	
14	Mining, copper	123,452	D-5,049		16 2	
20	Mining, other non-ferrous	98,717	10,827	-89 0	13 7	1 3
15	Office equipment	47,964	11,248	-76 6	20 8	4 7
9	Paint and varnish	14,138	4,044	-71 4	13 1	3 4
30	Paper and products	18,803	D-1,772		6 0	
52	Petroleum	345,231	D-63,704		13 1	
9	Petroleum, pipe line	12,934	12,649	- 2 2	14 6	18 0
26	Printing and publishing	52,177	26,675	-48 9	19 1	9 6
23	Railway equipment	64,884	475	-99 3	8 1	

TABLE 56—SUMMARY OF BUSINESS PROFITS FOR THE YEARS 1929 AND 1931—
(Continued)

Number	Industry	Annual net profits fiscal years		Percentage change 1929-1931	Percentage return on net worth	
		1929	1931		1929	1931
22	Real estate	20,235	5,199	-74 3	10 2	2 5
9	Restaurant chains	8,439	4,997	-40 5	15 1	6 5
20	Rubber tires, etc	36,543	D-6,590		6 5	
9	Shipping	15,201	3,313	-78 2	9 1	2 1
10	Shoes	25,415	11,365	-55 3	12 4	5 5
16	Silk and hosiery	9,829	D-2,901		8 8	
9	Stock yards	6,215	5,514	-11 3	10 7	9 3
12	Sugar—Cuban	D-1,126	D-12,027			
20	Sugar—other	20,031	12,351	-38 2	6 2	3 8
20	Textile products, miscellaneous	77,993	263	-99 7	31 4	0 1
25	Tobacco	112,148	124,013	+10 6	14 6	14 4
7	Warehouse and storage	3,485	2,690	-22 8	8 6	6 5
4	Wool	D-5,503	D-3,693			
99	Miscellaneous, manufacturing	138,799	38,143	-72 5	15 1	3 8
41	Miscellaneous, services	35,970	7,510	-79 1	9 8	2 1
1302	Total manufacturing and trading	\$3,523,800	\$ 718,066	-79 6	13 5	2 5
156	Class 1 railroads	\$ 896,807	\$P-131,000	-85 4	7 0	1 0
60	Electric light, etc. ²	414,760	404,221	- 2 5	10 6	8 8
24	Bell Telephone companies	217,105	193,379	-10 9	11 2	6 8
60	Insurance companies ²	72,988	D-144,998		8 7	
18	Finance companies	36,575	26,859	-26 6	17 4	8 8
1620	Grand total	\$5,162,085	\$1,328,527	-74 3	11 3	2 6

D—Deficit From *National City Bank Bulletin*, April, 1932

P—Preliminary

¹ Includes principally calf leather tanners² Figures refer to shareholders only Because of the large proportion of bonded indebtedness, actual return on the property investment is less than the above³ Fire and casualty Figures represent total shareholders' gains or losses, on both underwriting and investments

made about earnings of most concerns without qualifying them by the uncertainty of depreciation. Only a minority of concerns take the trouble to inform their stockholders as to the amount set aside out of earnings for depreciation each year. It is common to include this item along with taxes and interest and even direct operating expenses or to report only earnings after depreciation. Neither do the circulars of investment bankers contain much information on this matter. This lack of publicity is to be condemned in the severest of terms. In mining and extracting industries depreciation on plant and equipment is frequently combined with depletion for wasting assets or reported without any depletion item whatsoever, most companies reporting only earnings after depreciation and depletion. The depreciation and depletion items are the most prolific sources of imperfect accounting.

In reality the depletion account of mining concerns is often only a bookkeeping entry to satisfy the requirements of federal income-tax regulations. Dividends are commonly paid on the basis of earnings before depletion. This practice is proper if ores are for all practical purposes inexhaustible, but improper if limited in amount, unless it is made plain that such dividends are merely a return of capital to its owners. Available data indicate that, on the average, extractive industries charge perhaps 4.75 per cent of property value to combined depreciation and depletion, the latter accounting for about one-fourth of the total. Sloan found that companies in non-extracting industries showed depreciation of 4.43 per cent of property value in 1926 and 5.63 per cent in 1927. This indicates great flexibility and conservativeness in depreciation charges compared with extractive industries. On the other hand, these charges constitute a much larger percentage of income in extractive industries than in the industrial concerns. As a rule, prosperous years show high depreciation charges, while years of depression show a material cutting down of depreciation.¹

Assets of Industrial Concerns.—Based on composite balance sheets of 544 industrial corporations in 1927² property account including land, buildings, and equipment accounted for 60 per cent of total assets, and current assets for 40 per cent. Current assets were composed of inventory 47.7 per cent, cash and marketable securities 30.7 per cent, and receivables 21.7 per cent.

Companies requiring large amounts of current assets in proportion to sales include those whose process of manufacture is long, as, for instance, the leather companies, or where a large variety of commodities is carried or manufactured and demand is slow. Industries seasonal in character are compelled to carry peak inventories for a short while. Those granting credit for extended periods of time require large liquid resources. Credit financing nowadays, however, is becoming a specialized function of finance concerns.

Current Ratio.—Much has been said and written about the current ratio. From the angle of the investor this ratio has two points of interest. In the first place, it has significance as an index of solvency. Whatever meaning it has in this respect is of the greatest importance to the security holder, since insolvency is invariably a calamity to security holders. But it appears that as an index of solvency it is generally of little importance. It is a liquidating standard at best and, except for seasonal and peak requirements, has no application to a going concern. It must be obvious to all upon reflection that bank loans based upon a normal amount of current assets for a business can be ordinarily liquidated only through realized net earnings. Commercial banks have erred from time out of

¹ See SLOAN, *op. cit.*, Chap. IV.

² *Ibid.*, p. 22.

mind in their failure to appreciate the fundamental significance of earnings

Current ratio is of especial significance to the security holder in connection with insolvency or liquidation. Here we cannot be certain of the exact status of each creditor in his claims for satisfaction, but there is no doubt that long-time security holders have had their claims diluted or absolutely nullified through the existence of short-time paper and other floating debts. Current assets are suitable for high-quality security, provided they are of the type that finds a ready market at their substantial values. In practice, corporations may be found with scarcely any current debts, the managements having set their faces against unsound financing of this sort. Others, whose existence hangs by a shoestring, use their borrowing power to the very limit, unmindful of the ruin which usually follows such a policy. Aggregate figures for American industrial corporations during the past 5 years show that a current ratio of 4.25 to 4.75 has become customary.

Inventory.—Inventory constitutes one of the gravest risks in certain industrial corporations whose raw materials and finished products are subject to violent price changes. The experience of 1921 led most corporations to follow a hand-to-mouth policy in their buying. This policy has been continued to the present times for the most part. Some severe punitive blows have been struck only recently at concerns attempting to speculate in raw materials by stocking up far in advance of their needs. Recent price declines were exceptionally severe on rubber and food companies, which speculated in the raw materials of their trade. Industries which are compelled to carry large stocks of materials and at the same time are subject to the destructive effect of competition are in a specially vulnerable position. Among such are the leather, meat-packing, tobacco, oil, and sugar industries.

In addition to the inevitable hazards connected with concerns compelled to take the risk of inventory depreciation, accountants followed the practice of arbitrarily marking inventory down to market value if that at the instant happened to be less than cost. This practice seems indefensible and serves no real purpose. It is even a false basis for bank credit. It distorts the results of operation in the calculation of earnings, which are thus arbitrarily marked down by inventory adjustments, artificial in character because they never will become real. Profits are never profits and losses never losses until realized in the course of the normal operation of business. Inventory adjustments lend false appearances to earnings and in the end may be largely only paper losses. The things bought are generally not the things sold. Inventories, unfabricated goods, and commodities must first be transformed before they are ready for the market, which may be months after the balance sheets are promulgated. Furthermore, the tendency to maintain profit margins

frequently makes it improbable that any but a fractional part of the paper losses will ever be realized at the time the goods are sold. It is time enough to enter losses when they are actually sustained

The importance of inventory is shown by the fact that 313 industrial concerns at the end of 1930 showed inventories equal to 55 per cent of net working capital, as compared with 66 per cent at the close of 1921.¹ Comparatively small changes in inventory values in the face of slow turnover and narrow profit margins would be especially severe on earnings statements

Accounts Receivable.—With some notable exceptions, most industries are conducted on a near-cash basis. On the average only about 20 per cent of current assets is represented by accounts receivable. They amount to less than 10 per cent of gross income, which means an average credit period of a little over a month. The amount of receivables will vary with the volume of business, the state of bank credit (increasing as bank credit becomes more strained), trade custom in certain industries, and durability and cost of the commodity. The first two of these have special application in cyclical fluctuations, while the last two are of great importance at all times

Cash.—Cash shows a tendency to fluctuate with changing business conditions within and without the industry. But most concerns have a cash policy which is the dominant factor in determining the average amount carried. The average concern today carries about 30 per cent of current assets in cash or its equivalent and it exceeds total current liabilities by about 20 per cent. Fluctuations in cash vary directly with sales, earnings, prosperity, depressions, and bank loans, and indirectly with the size of inventory, and accounts and bills receivable. The general tendency toward carrying large cash items has been facilitated by the post-war tendency for industrial concerns to do much of their financing through bond and stock issues

A compilation from the balance sheet of 914 industrial concerns at the end of 1928 shows cash and securities of \$3,853,000,000 against \$3,235,000,000 a year previous. This amounted to 38.95 per cent of net working capital at the end of 1928.²

Current Liabilities.—Current liabilities at the present time are on the average only about one-fifth of total current assets, about 7 per cent of total assets, only about three-fourths as much as the cash and equivalent items, and just about equal accounts receivable. Of all current liabilities it appears that bank loans account for less than 20 per cent, accounts payable for about 50 per cent, and miscellaneous items for about one-third.³ Depressed industries are the heaviest borrowers at banks and

¹ *Commercial and Financial Chronicle*, Vol. 132, p. 4310.

² Figures compiled by Ernst and Ernst, reported in *Chronicle*, Vol. 128, p. 3591.

³ *SLOAN*, *op cit.*, p. 271

at the present time include sugar, silk, woolen, leather, and fertilizers. Many prosperous corporations as a matter of policy have no bank loans. In ordinary times accounts payable and bank loans are not dangerous but, when credit conditions become strained and banks insist on satisfaction of their loans, bankruptcy often comes to the debtor corporation. The bank loan which is likely to give no trouble is the one which can be liquidated at maturity out of earnings or reduced inventory.

Capitalization —The structure of industrial finance has always been comparatively simple. A compilation by the *Chronicle* for the year 1899 covering 259 industrial consolidations, with aggregate capitalization of \$2,893,880,000, showed that only about 6 per cent was represented by bonds. At this time bonds were novelties in the investment market, but after 1903 they appeared in large numbers as emergency financing to pay bank loans and replenish working capital. This process was repeated after the panic of 1907 and the depression of 1921. Industrial bonds have been floated during the past decade at the rate of over a billion dollars per year. Capitalization of 544 leading industrial corporations in 1927 showed that funded debt amounted to 20 per cent of the total capitalization, preferred stock 17 per cent, and common stock 63 per cent. Bonded indebtedness amounted to 15 per cent of invested capital, and the surplus account to about 55 per cent of the common stock. This conservative showing is due to the relatively small amount of capital needed in manufacturing and the instability of earnings. To these might be added the hostility of commercial banks to industrial bonds.

While industrial bonds were originally confined to companies having a large percentage of their total assets in the form of fixed property of permanent value, of which the iron and steel companies furnish the chief illustration, recently they have been issued by almost every class of corporation. Even mining, oil, and tobacco companies whose assets seem ill-adapted to bonds have come into the market with large issues. The controlling factor in favor of bond and note issues was the absolute necessity of providing funds to pay bank loans and provide sorely needed working capital. Yet this situation should not lead one indiscriminately to condemn industrial bonds, for the history of finance amply shows that new methods of financing of railroads and all other types of corporations were born of necessity and were not the result of deliberate judgment. Doubtless many industrial issues are unsound but this is not peculiar to industrial financing, the financing of railroads in the past has been characterized by similar conditions.

Industrial Bonds —Mortgage bonds of industrial concerns will always be a smaller proportion of the total capitalization than in railroads and public utilities, because so large a percentage of their assets are current and unsuitable for the mortgage lien. The size of the mortgage issue will depend wholly upon the amount and character of the fixed property

The greater the stability of value of this property and the more likely that it will maintain its usefulness in the indefinite future, the larger in proportion may be the mortgage. If 50 per cent may be kept in mind for the average real-estate mortgage, the average industrial mortgage bond cannot approach this figure with safety but ought to fall within the limits of 25 per cent, and considerably lower than this figure in many cases. Industrial bonds should be of comparatively short maturity and are greatly strengthened by the inclusion of a sinking-fund provision which will cancel a substantial part of the debt by the time of maturity. Sinking-fund provisions for retirement of the debt should be a definite proportion of the amount of the issue outstanding or an absolute amount. On account of their fluctuating character, the net earnings of industrial corporations, over a period of at least 5 years preceding the issue, should average at least five times the interest and sinking-fund requirements on the mortgage issue if the bond is to command the respect of the conservative investor.

Within recent years collateral trust bonds have appeared among industrials in large amounts. They are, for the most part, evidence of movements toward consolidation through the holding company. Most industrial collateral trust bonds are based upon the common stocks of the subsidiary companies. The typical collateral trust bond is secured by the deposit of collateral of several times the market value of the bond issue. The protective provisions most frequently found in this type of bond are the following. The company issuing the bond agrees to create no future issues with equal or prior claims or permit its subsidiaries to do the same, except purchase money bonds for the acquisition of new property. The net current or quick assets shall always bear a definite proportion to the amount of the issue outstanding, usually from one to two times. A third provision forbids the issue of additional stock by the subsidiary companies whose collateral is deposited, unless deposited with the trustee as additional security. A fourth provision creates a sinking fund for the retirement of a definite proportion of the outstanding bonds by the time of maturity. The same result is frequently secured by the serial provision requiring the canceling of a certain proportion of the bonds each year.

The contractual features of the industrial debenture bond are similar to those of the collateral trust issue, except in the deposit of collateral as security. The typical debenture bond will also contain a number of additional protective features, the principal ones being: first, prohibition of the further creation by the issuing company or its subsidiaries of any other funded debt except by consent of two-thirds or three-fourths of the outstanding debentures, and then only in case the net assets of the corporation and its subsidiaries shall exceed $2\frac{1}{2}$ or 3 times the total funded debt, including the proposed issue, another provision requires the earnings

for 3 or 5 years preceding to be 3 or more times the total interest requirements on all funded debt before additional issues may be placed, a third additional requirement is that no dividend on the common stock of the issuing corporation shall be paid, unless net current assets remaining be equal to $1\frac{1}{2}$, 2, or $2\frac{1}{2}$ or more times the total funded debt, and that current assets of the company and its subsidiaries be equal to 200 per cent or more of current liabilities. The latter proportion is frequently as low as $1\frac{1}{4}$. The further details of debenture-bond protective provisions are almost endless. The main results sought in all of the provisions are simply the maintenance of sufficient equity in property back of the bonds and ample margin of earning power to cover interest requirements.

When measured according to earnings, industrial bonds give a good account of themselves as classes except in years of severe depression. Sloan's calculations show that 273 industrial corporations issuing bonds earned their interest 6.58 times over in 1926 and 5.25 in 1927.¹ The decline in 1927 was due largely to decreased profits. The usual wide variation among industries and individual companies again showed itself. Those industries showing bond interest earned from ten to twenty or more times over in 1926 and 1927 include electrical equipment, chemical, retail trade, food products, and tobacco products. On the other hand, rubber companies, theaters, paper concerns, sugar, cotton goods, coal, shipping and ship-building concerns earned interest less than five times over. The showing of many companies in the depression years 1930 and 1931 was poor indeed and disastrous in some cases. Even the United States Steel Corporation, whose earnings possess a fair degree of stability, did not earn its fixed charges from operation in 1931, while the average for the period 1922-1929 was something like six times interest. In general the companies which have the largest amount of fixed charges make the poorest showing as to the factor of safety, so that large debts may serve as a warning against possible danger.

Record of Industrial Bonds.—In 1920 there were only a few industrial bond issues in default, representing a rather insignificant sum and issued mostly by obscure corporations. At the same time there were over \$700,000,000 of railroad and traction bonds in default. Total defaulted industrial bonds since 1920 as of November 1 of each year were as follows:

TABLE 57 —INDUSTRIAL BONDS IN DEFAULT
(000 omitted)

1920	\$ 39,640	1924	\$123,894	1928	\$154,198
1921	71,236	1925	100,103	1929	123,850
1922	100,579	1926	93,825	1930	241,048
1923	96,811	1927	107,896	1931	670,464

Data from *Barron's*

¹ SLOAN, *op. cit.*, p. 179

In industrial defaults are included real-estate and hotel bonds. These two classes accounted for a large number of defaults in 1930. If these be omitted the amount is not large compared with total industrial bonds outstanding. Total industrial bonds in default in 1930 (November 1) were only about 39 per cent of all corporation bonds in default.

In the decade 1914-1924 total net losses on defaulted industrial bonds were 1.22 per cent of issue price of all bonds and the decline in value for all undefaulted bonds was 0.19 of 1 per cent. Deducting these losses from the yield of 7.02 per cent on all bonds issued, net yield for the decade was 5.8 per cent. For notes of over 5 years maturity, total net loss was 3.07 per cent on the yield of 7.06 per cent at issue price, leaving 3.99 per cent as net yield. Thus industrial bonds made a fairly creditable showing but the record of notes is distinctly unfavorable.¹

The market status of many industrial bonds is still low, perhaps lower than their record warrants. In June, 1931, 41 issues on the New York Curb yielded 7 to 25 per cent on current prices, of these, 30 yielded 10 to 25 per cent.

Preferred Stocks.—Typical industrial preferred stocks have cumulative dividends, prior claims on assets equal to par value or greater (issue price in case of no par issues) in case of liquidation, net quick assets of 155 per cent or more of preferred outstanding, total net assets of 200 per cent or more, and voting power contingent upon the non-payment of dividends for, say, two years.

Most of the provisions cited in connection with industrial bonds are also applicable to preferred stocks. The tendency has been to include even more of the provisions where preferred stocks are fundamentally weak. An additional provision commonly found relates to a retirement fund drawn from the earnings sufficient to retire a definite proportion or amount of the preferred stock outstanding each year. A feature is usually attached providing for redemption of the stock at the option of the company at a premium of 5, 10, or 20 per cent above the par value. While this adds little to the security of the issue, it may result in an unusually large profit to the stockholder. Much the same can be said for the participating feature commonly found in industrial preferred issues.

Aggregate figures for 544 industrial corporations show that in normal years preferred-stock dividends absorb about one-tenth of net income after fixed charges. But many industrial concerns, perhaps one-third of the leading ones, have neither funded debt nor preferred stock. Among these may be found many old conservative and prosperous concerns of today, so that the preferred stocks of individual concerns make a far less favorable showing than aggregate figures indicate.

The dividends on the preferred stocks of some dozen prominent industrials were dropped in 1927. Most of these had experienced diffi-

¹ A. S. DEWING, *Financial Policy of Corporations*, p. 821

culties in the years prior to 1927, the depression came as a decisive climax. Otherwise the depression of 1927 was without much significance for industrial preferred stocks. On the contrary, preferred issues as a whole are improving their position through increased earnings and retirement of portions of preferred issues outstanding. The fortunes of individual issues, however, are often uncertain, 1927 witnessing the passing of dividends on a few issues recently considered high grade.

The most complete record of industrial preferred stocks with which the author is acquainted is that prepared by A. W. Woodworth.¹ This record starts almost at the beginning of issue of this type of security in 1890 and covers 1,479 issues. Original issue prices were compared with market prices at the end of 1922. The results are disheartening. Issues representing 60 per cent of all capital raised in this way showed a loss of approximately 50 per cent of issue price, while 40 per cent showed a gain of only 9.7 per cent of issue price. The average issue price over this period of 30 years was almost exactly par. Total valuation at the end of 1922 was only 75 per cent of issue value. Price groups in 1922 were as follows:

TABLE 58.—PRICES OF 1,479 INDUSTRIAL PREFERRED STOCKS AT END OF 1922

Issues, per cent of total	Price	Number of issues
29.8	1 to 25	440
16.9	26 to 75	251
24.1	76 to 99	355
22.1	100 and up	329
7.1	Called	104
Total 100.0		1,479

From *Barron's*, Feb. 14, 1927.

The best showing was made by tobacco companies, with 14 issues out of a total of 21 selling above 100 or called at a figure above par. Milling companies, food companies, cotton goods, tire and rubber companies, convenience companies, chain stores, chemicals, and clothing stand relatively high. Concerns making the poorest showing were automobile and truck companies, meat and fish, textiles other than cotton, oil, coal, iron, and coke, iron and steel manufacturers, miscellaneous metals, construction, building materials, electrical equipment, agricultural equipment, brewing and distilling, and real-estate companies. The varying fortunes of the different companies are revealed by the fact that no classification is exempt from at least several issues in the lowest group. Of the 34 classifications, 18 show a larger number of issues in the lowest group than in the highest, while 16 show the opposite situation.

¹ *Barron's*, Feb. 14, 1927.

When considered on the basis of the capital involved, instead of the number of companies, the results are somewhat more encouraging. In the highest group (including redeemed stocks) is found 41.2 per cent, while only 19.8 per cent is in the lowest group. This leads to the conclusion that the issues of the largest companies have considerably better record than those of the smaller ones. In certain industries wide differences appear between companies of different size. In the iron and steel manufacturing group 36 per cent of the issues are in the lowest group but they account for only 2.7 per cent of the capitalization, while only 30 per cent of the issues are in the highest group but they have 80 per cent of total capitalization. Success in the larger companies is conspicuous and failure in the smaller ones is equally conspicuous in oil and refining, tire and rubber, railroad equipment, and agricultural implements. Failure of all companies large and small is conspicuous in automobiles and trucks, textiles other than cotton, coal, iron, coke, construction, electrical equipment, brewing, and distilling.

The ratio of 1922-1923 price to issue price was as follows

Iron and steel manufacturing	104.8	Tire and rubber	72.1
Clothing	97.2	Coal and iron	69.2
Chain stores	93.4	Office equipment	66.9
Railroad equipment	92.2	Other mercantile	64.6
Tobacco	89.2	Automobile accessories	63.4
Oil refining	88.6	Other textiles	62.7
Miscellaneous	86.4	Meat and fish	62.1
Milling	85.8	Building materials	60.6
Dry goods	83.2	Real estate	60.4
Consumers' conveniences	83.0	Automobile and trucks	59.9
Shoe and leather	80.3	Construction	55.1
Miscellaneous equipment	80.3	Specialties	53.6
Cotton goods	78.2	Paper	43.6
Agricultural equipment	77.1	Electrical equipment	42.0
Iron and steel products	76.8	Transportation	36.3
Other metals	75.4	Brewing and distilling	9.1
Chemicals	75.1	Average	75.0
Sugar and candy	74.8		

Common Stocks.—The great majority of industrial common stocks are aquatic in origin, having been originally issued to satisfy the demands of promoters and bankers, while large amounts were distributed as bonus shares to the purchasers of preferred stocks and bonds. Many of the stocks of large American corporations had their origin in the consolidation of the independent concerns into a single unit. On the other hand, it must not be forgotten that there are many large, as well as small, enterprises in the United States which have from the first been conservatively financed.

Aggregate statistics of leading industrial corporations show that, in 1926, 45 per cent of net profits, before charges, was used to pay dividends.

on common stock and, in 1927, 55 per cent was so distributed, the difference being accounted for by the comparatively steady dividends and fluctuating earnings. In spite of the lesser earnings of 1927, larger aggregate dividends were paid than in 1926, the previous record year. In 1926 thirty per cent and in 1927 twenty per cent was appropriated to surplus. The amount appropriated to surplus in 1927, however, was some 45 per cent smaller than in 1926. The larger companies seem to have made a better showing than the smaller ones. Empirical evidence seems to indicate that the average progressive industrial corporation should retain upward of 30 per cent of its net profits before interest for surplus and expansion purposes.¹ Leading food products and tobacco concerns showed a larger balance for dividends in 1930 than in 1929.

From the stockholders' point of view the problem of the average industrial concern is the payment of dividends in the face of fluctuating earnings. The placing of a stock on a regular dividend basis implies, or should imply, confidence in the ability of the corporation to maintain the rate except in case of unpredictable calamities, such as wars, earthquakes, and international calamities. Since dividends are paid out of cash, past earnings are seldom available for dividend disbursements and few companies have the courage to borrow for this purpose. The result is that few corporations will continue to pay dividends at the regular rate if unearned.

Market for Industrial Securities.—The market for industrial bonds is rapidly undergoing a change. Although a few bonds of this class were included in the portfolio of the average large investor previous to 1907, it was not till after the good account which these bonds gave of themselves during and after the panic of 1907 that the market began to broaden. Many people had their confidence shaken in railroad and public-utility securities during the initial stages of rate control, and they turned to industrial bonds and preferred stocks which were presumably free from governmental interference. With the war came prosperity to industrial concerns and lessening confidence in public-utility and railroad securities, with the result that industrials were elevated to their just position in the investment market. The popularity which they attained is indicated by the fact that, of the total of something like \$5,000,000,000 of industrial bonds outstanding in 1924, one-half or more were issued in the period following the war. The new popular interest in investments created by the Liberty bond campaigns was quite naturally diverted to industrial preferred stocks and bonds. This broadened the market immensely. Large investors, regarding the high federal taxes as more or less permanent, sought to increase the net yield on their funds by shifting from these classes of securities to industrials of higher yield. The broadening of the market did not stop with bonds and preferred stocks but

¹ SLOAN, *op cit*, p. 18

included, also, the common stocks of many of the larger industrial concerns. The prosperity of industrial corporations during the decade of the nineteen twenties appears to have created a permanent, widespread preference for industrial securities of all classes.

In spite of the general pessimism which prevailed in 1930-1932 among the marginal-trading fraternity, common stocks of industrial companies as of most other classes of corporations have continued in popular favor. Even after the panic of 1929 General Motors stockholders increased in number from 140,113 in the third quarter of that year to 240,483 in the first quarter of 1930. At the beginning of 1931 stockholders number 286,378. Of these, 113,404 owned only from 1 to 10 shares each and 235,285 owned less than 100 shares each. The large increase in number of stockholders of leading corporations during 1931 has already been referred to in another connection.

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CHAPTER XXVII

BANK STOCKS

Banking institutions have had a long and varied history. Their operations and functions have undergone an evolution unique in the annals of economic institutions. The commercial bank as it exists today is mainly the product of the nineteenth century. It consists essentially in making and withdrawing of deposits, loaning money, clearing of checks, the issue of bank notes, and so forth. The origin of each one of these processes may be traced far back into history. An appreciation of the modern bank is greatly enhanced by a firm grasp upon the main features of its development.

Early Banking.—As early as 2000 B.C., the Babylonians had developed rude banking in connection with their temples as an incidental service performed by the institution of the cult. The business of these banks was to loan money in some ways similar to modern bank loans. Loans in anticipation of coming harvests were typical. Promises were given on clay tablets, the negotiable commercial paper of those days. Thus runs the record of an early loan, "Warad-Ilsch, the son of Ibbatum, one shekel of silver by the Sun-God's balance. This sum is to be used to buy sesame. At the time of the sesame-harvest he will repay in sesame, at the current price, to the bearer of this document."¹

In the sixth century B.C. private banking flourished. There are records of the Igibi bank of Babylon, an institution similar to prominent European and American banks of today. "The records of this bank show that it acted as buying agent for clients, loaned on crops, attaching them in advance to insure reimbursement; loaned on signatures and on objects deposited, and received deposits on which it paid interest."²

At the height of Greek prosperity, banks performed specialized services for their customers. There were the *trapezitai* (a name still in use) who received deposits on interest and subject to check; the *krematistai* who tested and exchanged coins, and the *daneistai* who were the money lenders of the time. Letters of credit for foreign transactions were in common usage. As in Babylon, temple banking dominated, led by the temples of Ephesus and Delphi. Temple banking lost its hold on the banking system when irreverence for the ancient gods destroyed public confidence in these institutions. In addition to these, everywhere were to be found banks established by the state.

¹ *Encyclopaedia Britannica*, 14th ed., Vol. III, p. 67.

² *Idem*.

Banking in Rome was similar to that in Greece except that no state banks existed, temple banks and private banks occupying the entire field. Rome, however, went one step further and established strict regulation of banks. Fraud was of rare occurrence and confidence high. Egypt adopted bodily the Greek system.

Mediaeval Banking.—Roman banking declined with the decay of strong central government and in mediaeval times there was nowhere strong central governmental authority to nourish the banking system back to life. Nevertheless, banking continued to survive under the aegis of the Church. People entrusted their money with Church officials as deposits or bought an annuity. Documents entitling the holders to receive stated amounts from the Church circulated widely as commercial paper of a negotiable type. The *Templars* were the most famous of the Church organizations and conducted almost every type of banking known to the times. Private banking did not flourish, largely because of the opposition to interest itself reinforced by Aristotle's position that money was barren and hence interest immoral. However, the necessity for funds of some of the city states brought private banks as lenders to these public bodies as early as 1148 in Genoa and 1157 in Venice. Private banking also was developed by the Jews, Lombards, and Cahorsins. Upon admission of Jews to the privilege of lending at interest, compulsory lending on good security became an obligation.

Private banking was mainly for the purpose of meeting the demands for consumption credit of the aristocratic element in city and country; bankers also lent in a limited way to handicraftsmen and traders. Demand was so great that interest-bearing deposits were sought of the public, and among well-to-do business friends. The Lombards drew heavily upon Italian business houses for funds for relending. Money changers (*campsores*) flourished on account of the various coinage systems in Europe and their frequent debasement. The money changers held the minting rights and they were also engaged in receiving and lending money. Merchants deposited their funds with them for safekeeping, out of which grew a local transfer or clearing system and later for inter-city payments and finally into the bill of exchange in foreign countries. Later the bill of exchange was issued on a credit basis instead of being issued for the deposit of money. Among the money changers the Florentines occupied a commanding position. They were prominent in financial transactions with the Roman Curia, the Kings of France, England, and Naples.

In the North were the Hansards who dealt mainly with the English and Scandinavian rulers. But the downfall of the rulers of the sixteenth century brought ruin to many of these houses which carried down with them their business associates and depositors. These heavy losses led to the establishment of municipal transfer banks which aimed at absolute security against the use of deposits for loans. The lending of deposits

was unreservedly condemned and banking reverted to a transfer system alone. Such banks were found in Italy as early as the fifteenth century and later in Amsterdam (1609) and Hamburg (1619). These banks establish standards for coins which greatly facilitated exchange. But they eventually engaged in business relations and loaned money to public authorities. These practices in some cases led to their downfall.

Modern Banking.—In the seventeenth century the most significant development grew out of wholesale trade and shipping. Banks serving these interests dealt in bills of exchange in a large way and their personnel was of rich constituency. They were connected with the beginnings of the security brokerage business. They engaged in floating bonds for governments and used transferable certificates of small denominations which were in turn sold to the public, thus recouping their outlays. From this type of banking sprang the institutional banking houses of England and the continent and later of the United States. Most famous of these in England was Rothschilds and in the United States the house of Morgan.

To the functions of deposit and clearance, developed by the money changers and transfer banks and the development of the discount market, was added the function of note issue at the end of the seventeenth century. Banks of issue were organized to serve governments and business concerns alike. These developed first in Naples and in Genoa in 1675. Notes were transferable by endorsement. But the goldsmiths of England did most to develop the note. They found their opportunity when in 1640 Charles I attached the deposits of merchants in the royal mint as a step in a forced loan to the government. Large depositors flocked to the goldsmiths, who agreed to pay interest on deposits and repay them on demand, while in the meantime using them for loans. Depositors were permitted to use a draft on the goldsmiths which in turn could be used to make payments. Out of this came the check. Deposits could also be transferred by delivery of the demand vouchers, which were the beginning of bank notes in England. These vouchers circulated as money and required little cash to redeem them, since confidence in the goldsmiths was great. Finally demand vouchers or notes were issued as the proceeds of loans made without deposits back of them. The government assumed responsibility for note issues of the goldsmiths and in 1672 suspended payments, which destroyed confidence in both the government and the goldsmiths, to the ruination of the latter. Finally in 1694 in order to supply the needs of the government, the Bank of England was established, subscriptions to the stock being used as government loans. The bank was empowered to engage in all types of banking operations, thus combining the functions of the transfer and the commercial banker. Similar institutions were established on the continent of Europe in the eighteenth century and became central banking systems of the various countries.

But the modern commercial bank developed in the eighteenth century. Its function was lending to wholesale merchants and the rising manufacturing classes with merchandise as security. Previously these had depended on the bill of exchange to raise needed money.

Banking in the United States ¹—The closing decades of the eighteenth century saw the beginning of banking in the United States. The Bank of North America established in 1781 and the First Bank of the United States in 1791 were modeled on the British plan and served much the same purposes. A considerable number of other banks were established along the Atlantic seaboard to serve the trading and manufacturing classes. After 1800 American expansion to the west and the development of industry created a demand for banks in large numbers that could supply the needed capital for this program. This introduced a fundamental change in the sound principles of the preceding period. Bank notes were now issued to finance land purchases and for the erection of plants with no liquid assets as security. It led to local banking which down to the present time has characterized the American banking system. By 1811 there were 88 banks in the entire country while 713 were operating in 1836. The strong demand for local banks and the liberalization of corporation laws in general made it unnecessary to get special charters. But general bank acts were passed in most of the states, which made it possible for a small group of men to organize a bank without difficulty and, it may be added, without capital, since notes were frequently accepted as initial capital. Note issues followed in large amounts against land and fixed property pledged as security. The *bête noir* of these banks was the presentation of notes for redemption by other banks, in the main the First and Second Banks of the United States—a practice which led to the undoing of the latter.

From 1836 to 1914 the United States had no real banking system but the functions of banks were carried on by thousands of independent units, each operating on its own responsibility. Mutual help was frequently given in this period and the stronger banks frequently held up the hands of the weaker institutions. After the expiration of the charter of the Second Bank of the United States in 1836, down to 1863, banking was entirely in the hands of the state authorities. This was the era of "wild-cat banking." Its main characteristics were the lack of real capital, consequent fraudulent capitalization, and lack of an adequate system of note redemption. Many banks were poorly managed and hung by a thread, many more indulged in excessive note issues, so that each business crisis engulfed them in ruin, dragging the depositors down with them. As to the stockholders, their losses were without hope. The attempt to cope with unsound note issues led to limitation on the basis of a certain

¹ A convenient summary of banking in the United States is found in the *Encyclopædia of the Social Sciences*, Vol. II, pp. 441-444, by O. M. W. Sprague.

proportion of their capital. But where capital was fictitious, this offered little restriction. Everywhere notes went at a discount and it was considered improper to ask banks to redeem their notes on account of the expense and danger of transfer. Where notes were limited on the basis of deposits, bogus deposits were created to permit further expansion. Several types of chicanery were resorted to in order to postpone redemption of notes.

This was the period of "free banking." It was inaugurated in 1838 by New York, where general banking laws were passed permitting a small group of persons to organize a bank merely by complying with stipulated conditions. Notes could be issued upon the deposit with state authorities of bonds of the United States, those of any state, or upon the security of real estate. Five years of failure and disaster followed this law, 29 banks failed and the security back of the notes brought only 74 cents on the dollar. Similar experiences came to other states. In Michigan 36 out of 40 banks failed in two years, and in Indiana 51 out of 94 failed before the panic of 1857. Banking in many instances had been conducted by irresponsible persons on note issues exclusively and the organizers located their banks at inaccessible points where no business could be done.¹ In this period great progress was made toward sound bank notes, the tendency everywhere being toward bond-secured notes with collateral back of them sufficient for redemption, regardless of the misfortune of the banks themselves. But losses to noteholders and the evils of discount prevailed even down to the time of the Civil War. Limitation of amount of issues to the capital of the bank was made effective in some states by provisions requiring specie to be paid in for capital. In this period banking codes were developed regulating banking practices and providing a system of examination and supervision by state authority. A minimum amount of capital was required for organizing a bank, loans were restricted, limiting the amount on real estate or to any one borrower, and minimum reserves against notes and deposits were required. But the unrestricted granting of charters with inexperienced and incompetent managements continued and the system of local banking with little diversification in its loans prevailed.

With the Civil War came the establishment of the national banking system. This made a fundamental change in note issues. By placing a tax of 10 per cent on state bank notes in 1865, state banks were driven into the national system, which soon almost completely occupied the field. Notes were now uniformly issued on the basis of government bonds and a 5 per cent redemption fund provided in the treasury.

With the increased use of the deposit and check system in the eighties, state banks began to revive. More liberal state laws respecting loans and

¹ C. H. GARNETT, *State Banking Issues in Illinois*, pp. 49-50

reserves and capital requirements gave great impetus to state banking. Moreover, banks and trust companies were organized with the power of dealing in fiduciary transactions with their customers (a privilege then not open to national banks).

Bank Failures.—From the establishment of the national banking system in 1863 down to 1920, bank failures were comparatively few in number. In the period 1897–1920, national bank failures averaged only about 12 per annum. But in the 9 years 1921–1929 the average number of failures per year was 77, or 697 in all, with liabilities of \$418,000,000. State banks and trust companies in the latter period had a far worse record. While their number was about $2\frac{1}{2}$ times that of national banks and capital and surplus 15 per cent greater, failures numbered 3,004 and liabilities amounted to \$1,174,000,000. Failures in the latter period were far more serious than in the early period. In the early period a high percentage of assets was recovered and paid to depositors, while in the recent period only about one-half of the assets was salvaged.¹ As for stockholders, little remained in either period.

The total number of national bank failures from organization of the system to October 31, 1929, was 1,313, with capital of \$143,670,420. Of these only 72 were restored to solvency. Assessments aggregating \$92,315,740 had been levied against those stockholders and finally a distribution to shareholders of \$16,211,624 was made as salvage from the wreck.²

Bank suspensions in 1930 and 1931 reached appalling figures. In 1930 they numbered 1,345, with capital investment of \$111,000,000 and deposits of \$864,000,000. In 1931 there were 2,290 suspensions, with deposits totaling \$1,759,484,000.

Causes of Failures.—The causes of bank failures may be divided into human and environmental, the latter may be further subdivided into general and local. The causes of failures may best be determined by

TABLE 59—BANK SUSPENSIONS ACCORDING TO SIZE AND MEMBERSHIP IN THE FEDERAL RESERVE SYSTEM, 1921–1930

Capitalization	All banks	Member	Non-member
Less than \$25,000	2,667		2,667
\$25,000	1,606	396	1,210
\$25,000 to \$99,900	1,831	500	1,331
\$100,000 to \$999,900	740	273	467
\$1,000,000 and over	20	9	11
Total	6,864	1,178	5,686

Annual Report of the Federal Reserve Board, 1930, p. 131

¹ J. W. DOWRIE, *American Monetary and Banking Policies*, p. 128.

² *Report of the Comptroller of the Currency, 1929, pp. 22–27*

dividing banks themselves into several classes based upon size, location, position in the banking system as a whole, and effectiveness of public supervision

A classification of banks with reference to size and membership in the Federal Reserve System for the years 1921-1930 goes far toward explaining the underlying causes of failures. Banks with \$25,000 capital or less account for over 61 per cent of all suspensions, and 89 per cent of these were state institutions outside the Federal Reserve System. It must not be overlooked, however, that 20 banks with capital stock of \$1,000,000 or more failed during the decade. One of these, the Bank of the United States, in New York City, had \$160,000,000 deposits, while two others had \$38,000,000 and \$35,000,000 capital, respectively.

Bank failures were mostly in the smaller cities and towns. Of the total number of failures during the decade 1921-1930, 39 per cent were located in towns under 500 population, 59 per cent in communities of 1,000 or less, and 79 per cent in places of 2,500 or less, only 6 per cent were in cities of 25,000 or more.

The number of bank suspensions and deposit liabilities for the years 1930 and 1931 were as follows:

TABLE 60.—BANK SUSPENSIONS IN 1930 AND 1931

Banks	1930		1931	
	Number	Deposits, millions	Number	Deposits, millions
Total	1,345	\$864	2,290	\$1,759
Member	187	380	518	776
Non-member	1,158	484	1,772	983

Federal Reserve Bulletin

At the beginning of 1930 the number of member banks of the Federal Reserve System was 8,522 and of non-member banks 14,926. The number of failures of the former amounted to 8.3 per cent and the latter to 16 per cent. The total individual deposits of member banks at the beginning of 1930 were \$33,031,000,000 and of non-member banks \$9,565,000,000. The percentage of deposits of failing member banks to total deposits of member banks was only 3.8 per cent, while the corresponding figure for non-member banks was 15.3 per cent. These results seem to indicate that membership in the Federal Reserve System is of decided advantage to banks.

The Federal Reserve Board reports total bank failures in 1930 and 1931 by reserve districts as follows.

TABLE 61—BANK SUSPENSIONS BY RESERVE DISTRICTS, 1930 AND 1931

District	Number		Deposits, millions	
	1930	1931	1930	1931
Boston	12	33	\$ 36	\$ 125
New York	11	80	187	160
Philadelphia	10	101	43	157
Cleveland	41	182	41	407
Richmond	152	203	85	122
Atlanta	140	135	91	54
Chicago	266	630	111	444
St Louis	358	264	182	71
Minneapolis	156	271	24	60
Kansas City	137	222	28	52
Dallas	41	93	16	53
San Francisco	21	76	16	49
Total	1,345	2,290	\$860	\$1,694

Federal Reserve Bulletin

In 1930 only 33 of these failures were in the Boston, New York, and Philadelphia districts, while St Louis and Chicago districts accounted for 624, or over 46 per cent of the total. The states of Arkansas, Illinois, Missouri, North Carolina, Indiana, and Iowa accounted for 634, or over 47 per cent of the total. In 1931 failures were more widely scattered and had become general over the United States. The Chicago district made the worst showing with the Cleveland district a close second. Also the Philadelphia and Boston districts suffered severely in this year. Pennsylvania, Ohio, Illinois, Michigan, and Massachusetts in the order named made the worst showing among the states, altogether they accounted for 53 per cent of all deposits in failed banks.

Management—Within banking circles and among students of the subject, great emphasis is laid upon the defects of management as causes of failure. Repeated condemnation of the small-unit banking system is heard and with justice. Most of the states do not permit branch banking and the system still in vogue is the one inherited from the experiences of the nineteenth century. Failures are more numerous where the density of banks is greatest. The Federal Reserve districts of Boston, New York, and Philadelphia during the years 1921-1927 had only 43 failures. The population of these districts in 1927 was 33,000,000, which was served by 3,300 banks, or 1 bank for each 10,000 population. The Minneapolis district has a population of only 3,500,000 but, after 1,087 failures in the years 1921-1928, still has 2,633 banks in operation, or 1 to every 1,330 population. New York with 11,000,000 population in 1920 had 1,560 banks and only 10 failures in the following 10 years, while North Dakota

with a population of 650,000 had 898 banks, or 1 for each 750 population; failures were 349¹. The small bank is defective, in that insufficient opportunity is afforded for proper diversification of its business. It is likewise highly improbable that sufficient banking talent can be found to direct the destinies of banks among each 1,000 population.

Although from the time of Adam Smith banking has been considered a business largely of routine operations, nevertheless, large responsibility is justly attributed to the management for bank failures. Safe banking, like safe investment, is as much a matter of moral courage as it is of judgment. Safe paths are fairly well marked out but it is the greed for profits that defeats the best judgment of the management. Loans are made in excess of conservative amounts on the basis of farm and urban land, or fixed assets. Personal loans of a non-liquid character are indulged in. Funds are placed in unmarketable securities with long maturity. Gradually assets become frozen, so that the bank cannot meet its demand liabilities and the doors are closed. Then when depression and adversity come and low interest rates prevail, expenses which ran wild during prosperity exceed income and the deadly hand of poor management is revealed.

It will usually be found that failure was due largely to laxness in the board of directors, who did not keep a watchful eye on the officers during good times. Laxness of the directorate is a fundamental weakness in the banking system of the United States. It extends from the simplest country banks, with a handful of directors, to the metropolitan institutions, whose directors are numbered by the scores and who serve no banking function worthy of the name. This recent tendency to inflate the number of members on boards of directors is deplorable and arises out of the misapplication of the principles of aggressive business methods to the banking business. Such directors are likely to be more interested in milking the bank to the advantage of their own business, caring less about the solvency of an institution charged with the social function of keeping the public's money.

The lack of attention to bank affairs manifested by many boards of directors has been repeatedly deplored by the comptroller of the currency, who has made some efforts toward remedying this defect. The duties of boards of directors were set forth by a judge in a bank case as follows:

I will say to you, as a matter of law, that a board of directors when they have selected officials, cannot leave everything to them. They must do more than select officials. Otherwise they would simply be a nominating committee. They are required to select honest officials, and they are required further to use the same degree of care and prudence that men prompted by self-interest generally exercise in their own affairs. They are required to give direction to the general

¹ O. M. W. SPRAGUE and W. R. BURGESS, *Recent Economic Changes*, Vol. II, p. 695

affairs of the bank and its business policy and have a general knowledge of the manner in which the business is conducted, the character of the investments, and the employment of the resources

Supervision.—The shortcomings of bank supervision are doubtless responsible in part for numerous bank failures. While the bank examiner and other officers charged with supervision cannot in any sense be substituted for the managers, nevertheless violation of well-recognized principles of sound commercial banking should not be treated lightly. It is a well-known fact that banks do not suddenly fall into financial insolvency but that the process is one of gradual slipping. It should be the function of supervision to correct bad practices the moment examination reveals their presence. This has usually not been done but banks have been allowed to approach the edge of the precipice before remedial measures were attempted. Then only financial surgery holds any hope and recoveries are all too rare. Bank examiners and supervisory officers have sometimes been political appointees and unsuited for their task. No excuse can be found for failure of public authority to provide for adequate supervision over the custodians of the public's money. State authority has been more lax than national authority. Banking laws relating to supervision may well be improved. In the first place, authority should be given to the officers in charge of the banking department to restrict the free chartering of new institutions, to the end that no more banks should be chartered in communities already well served, where this power already exists it should be rigidly enforced. A competent directorate with officers experienced in the banking business should be a prerequisite. Furthermore, copies of examiners' reports should be sent to each director. It has been strongly suggested within banking circles that the power to suggest dismissal of officers should be given to the examiners. Likewise it is thought with reason that the unit system should be replaced by a branch-banking system such as is found in almost every other country.

After all is said, banks are, nevertheless, peculiarly creatures of their environment. They serve the communities in which they are located and their fortunes ebb and flow with those of the communities. They maintain relations with the business concerns of these communities, and when business failures are large, banks suffer in proportion. Perhaps the most important cause of difficulties from general conditions in the recent period was the deflation of commodity prices following the war. This was especially severe in agricultural products and the banks serving farm regions found the fundamental security of their assets vanished. In addition, large areas suffered exceptional drouth in 1930 and 1931, which undermined the general prosperity of those districts. Aside from these matters, there was the disastrous decline in the prices of bonds and stocks which were either owned outright or served as collateral for loans

to customers To complete the picture, real-estate booms in Florida and elsewhere with the collapse that followed dragged scores of banks down to insolvency

Consolidations of Banks.—The American banking system after a century and a quarter of experience with small independent local banks seems now in the process of a profound revolution Of the 27,633 commercial banks that existed in 1920 over 8,000 have failed, thus materially reducing their number This has affected mainly the West and the South Two constructive movements are under way at the present time which ultimately will completely revolutionize the American banking system and bring it in line more with systems of other important industrial countries These movements are toward consolidation and branch banking A brief account of these movements will give a good idea of the progress already achieved

The movement in this country was preceded by similar movements in other countries In Canada a quarter of a century ago there were some 30 banks transacting all of the commercial business of the country These have been progressively reduced until today there are only 10, with a few of the largest holding a dominating position In England more than 80 per cent of the country's banking resources are in the hands of five large banks with 10,000 offices At first Japan copied our unit banking system but after a short while abandoned it in favor of a comparatively few strong institutions

In the United States the movement for consolidation has progressed most rapidly in the large metropolitan districts In New York City there have been half a hundred mergers within the past 10 years

Branch Banking in the United States.—The earliest federal banks, the Bank of North America chartered in 1781, the First Bank of the United States established in 1791, and the Second Bank of the United States established in 1816, all had a number of branches After the expiration of the charter of the Second Bank of the United States in 1836, no banks were established with branches The public was set against the centralization of banking and embarked upon an exclusively local unit banking *régime* which has persisted almost down to the present time The national banking act made no mention of branches and the comptroller of the currency and the attorney-general had always interpreted the law adversely to branch banking However, state banks coming into the national banking system through consolidation were allowed to stand as branches In 1921 the comptroller of the currency reversed his attitude on branch banks and at that time there were only 29 banks with branches, all of which were the result of conversions from or consolidations with state institutions The reversal of public attitude on branch banking came after state banks in New York, Detroit, Cleveland, and other cities had gone far in establishing branches within the

metropolitan districts. Offices for the receipt of deposits and cashing of checks were authorized after 1921 by the comptroller. In 1927 the McFadden Act was passed. It authorized the continuation of branches of all descriptions of state institutions converting into national banks.

The provision of the McFadden Act relating to branch banking must be viewed in the light of developments in state-wide branch banking under the laws of a number of states. Prior to 1919 there was little interest in state-wide branch banking. But in that year California passed a law permitting this development of state institutions. The origin is said to have been with a small number of ambitious bankers of San Francisco and Los Angeles. Independent bankers and public officials alike placed every obstacle in the path of the ambitions of the men prior to 1927 when the election of a friendly governor opened the way for further extensions. The leader of the group was the Bank of Italy (now Bank of America), which has over 300 branches within the state and is one of the outstanding banks of the country. The movement has proceeded in other states until now 22 states definitely permit branches of some sort, 20 specifically forbid them, and in the laws of six states no opposition is found. Eleven of the states permit state-wide branches and 11 confine them to the city where the main office is located.¹

Many of the advantages of large-scale production in general are applicable to banking and undoubtedly much expense is saved through consolidation into a branch system. Failures under this type of banking will undoubtedly be less than under the unit system, since branches receive the support of all the resources of the institution. State-wide branches also enable banks to secure a large measure of diversification of loans and investments and thus strengthen them in times of adversity. Many, and perhaps most, of the leading authorities on banking now advocate a branch-banking system, while bankers themselves are more and more favoring this system. The comptroller of the currency is actively engaged in the advocacy of federal laws which will enable national banks to establish branches in districts perhaps as broad as the Federal Reserve districts themselves. In the meantime chain banking through the instrumentality of the holding corporation has extended far, doubtless as a preliminary step in the final establishment of branch banking.

Bank Revenues.—Until recently it was impossible to learn much about the earnings of banks. The law requires the frequent publication of balance sheets but makes no such requirement as to earnings. Nor have banks followed the practice of business corporations in publishing earnings statements. Information on earnings is obtained by public authority in the supervision of banks but is regarded as secret. Reports to stockholders sometimes include earnings statements. But the amount

¹ DOWRIE, *op cit.*, pp 27-43

of information as to bank earnings to which the public has access is indefensibly small. This situation is all the more surprising when it is considered that banks were among the first corporations to come under public regulation. There still exists the fear of the light of day among banking officers as also among public authorities. Banking is thus deprived of one of the strongest forces in checking the management, namely, the light of publicity. It is incredible that this matter should much longer remain in the dark-ages stage of finance.

For some years, however, the Federal Reserve Board has published model statements of the earnings of all member banks, with divisions between state and national banks and grouped according to reserve districts. Certain observations drawn from this source are given below.

In the year 1928, a year of normal conditions, member banks' earnings were derived to the extent of 83.4 per cent from interest and 16.6 per cent from other sources. Twenty-six per cent of the interest was derived from investments and 74 per cent from loans. It is evident from this statement that the rate of interest charged customers on loans and the volume of loans outstanding are the most important variables in the earnings of banks. The swollen amount of brokers' loans and high interest rates in 1929 were largely responsible for a rise of \$188,000,000 in earnings on loans, an increase of almost 14 per cent over 1928. In the following year 1930, conditions were reversed and interest on loans dropped somewhat below the amount shown in 1928. The remarkable constancy of earnings on loans, other than brokers' loans, is attested by the experience of the past 3 years.

Expenses.—Expenses of banks in 1928 showed 46.4 per cent of the total paid for interest on deposits, 27.3 per cent for salaries and wages, 7 per cent for taxes, and 19.3 per cent for other expenses. The effect of changes in the interest rate on deposits is obvious from these figures. In order to avoid ruinous competition in this respect, clearing house associations generally are influential in establishing uniform rates on deposits within their respective communities. Expenses have a rigidity far exceeding that of income. In 1930 gross income dropped 10 per cent, while expenses declined only 4.7 per cent. Interest on borrowed money is a highly flexible item but is comparatively small in the expense account. Taxes in 1930 actually increased over 1929.

Reserves.—Banks generally carry a reserve account. This account is frequently specific in nature, as for accrued taxes and interest on deposits. Sometimes reserve for taxes is contingent upon the passage of a law or its interpretation by the court or taxing authorities, and if finally the outcome is in favor of the bank this fund reverts to the undivided profits account. In case the banking house is carried at a sound valuation, a reserve for depreciation is carried but more often real estate is entered in the statement at a nominal figure, commonly at \$1, although

its value may be in the millions. Banks frequently carry a contingent reserve fund the nature of which can seldom be ascertained from the statement.

Net Earnings.—Net earnings must be adjusted for losses charged off and recoveries on charged-off assets. Bank earnings are affected perhaps to a greater extent than those of any other classes of corporations by changes in capital values. Bad loans and depreciated investments are generally charged off as soon as recognized, although recognition in this respect is frequently delayed. In 1930 total losses on loans and discounts and investments amounted to \$303,753,000, a sum equal to almost 50 per cent of net earnings. Recoveries amounted to only \$35,736,000. Even in 1928 losses on these items were \$164,583,000 and recoveries only \$37,977,000. After net losses, net addition to profits amounted to \$306,502,000 in 1930, against \$503,868,000 in 1928, and \$556,514,000 in 1929. The slump in this item in 1930 from 1928 amounted to over 39 per cent and over 45 per cent from 1929. From 1923 to 1929 net profits on capital funds (capital, surplus, and undivided profits) varied between 7.69 per cent in 1923 and 9.14 per cent in 1925, averaging 8.09 per cent for the period. In 1930 the figure dropped to 4.56 per cent.

Efficiency of Bank Operations.—Comparative efficiency in bank operations may be measured in some degree by the relation of net profits to earning assets. But for the comparison to be valid, only banks similarly situated should be compared, while comparisons for different years may be meaningless, owing to changing interest rates. The trend of this ratio for all member banks during the period 1923–1929 was decidedly upward, advancing from 1.29 to 1.56 per cent for the period.

Bank Assets.—Banks are required to publish statements of assets and liabilities periodically through the year. In this respect publicity of bank affairs is ideal. Nevertheless, bank statements too often contain much dead timber. Bad loans and depreciated investments are not eliminated from statements until ordered by procrastinating bank examiners. Since bank loans and investments are from five to six times the amount of capital, surplus, and undivided profits, a comparatively small amount of bad paper is disastrous to bank capital. Bank statements can seldom be accepted at their face value. This is deplorable on account of the fact that the stockholder is helpless in an attempt to secure more detailed information.

In the United States, laws governing banks everywhere require certain cash reserves against deposits. To some extent this determines the nature of part of the assets. At the end of 1928 members of the Federal Reserve System had approximately 5 per cent of their total assets as reserve in the central banks. In addition to this a certain amount of tall money to meet the demands of depositors must be kept. Banks

also keep a secondary reserve in readily marketable securities. In 1928 this amounted to 21.5 per cent of total assets, 41 per cent of which was in government securities and the balance in state, municipal, and corporation bonds and stocks. The largest item in the asset list, however, is loans and discounts which were 51 per cent of total assets in 1928. Most of the remaining assets are included in the items banking house, furniture and fixtures, exchange items, amounts due from other banks, and so forth.

There is a notable tendency for banks, especially those located in financial centers, to invest larger and larger proportions of the earning assets in investments. In 1914 investments of national banks were less than 30 per cent of loans and discounts but in 1929 they had advanced to over 45 per cent. This is largely the result of changes in methods of industrial finance since the war. There has been a distinct tendency for industrial corporations to finance themselves through long-time securities. Banks seek to keep their funds invested in bonds, which constitute a readily available source of cash. It is to be feared, however, that this has been a source of embarrassment to many banks (especially those located in country districts) uncritical in the selection of bond investments. Regulations of the comptroller of the currency have generally required investments to be entered in statements at market value. Owing to the severe decline in most security prices in 1930 and 1931, banks were permitted to enter prime investments at par or on sound valuation, while second-rate bonds were required to be carried at a reasonable discount. This ruling permitted 75 per cent of bank investments to be carried above market quotations.

Since 1915, loans secured by stock collateral gained in proportion to commercial loans. In 1915 national banks showed 24 per cent of all loans and investments to be loans and in 1929 they were 31 per cent. Stock loans of the demand type are specially popular among the larger institutions. State institutions in the larger cities appear to hold larger percentages of their resources in investments rather than in loans and discounts and a larger proportion of these is invested in other than United States securities.¹ State institutions of the Chicago district showed a considerably larger percentage of their resources to be income yielding.²

Bank Liabilities.—The liabilities of banks are largely their demand and time deposits. There has been a strong trend toward time deposits since the war. In 1914 less than 20 per cent of total deposits of national banks were time deposits, but in 1919 time deposits were almost 44 per cent of the total. At the end of 1928 over 68 per cent of total liabilities of member banks of the Federal Reserve System were time deposits. This is a distinct advance in the strength of banks, since loans and

¹ University of Illinois *Bulletin, Bureau of Business Research*, No. 28, p. 50.

² *Ibid.*, p. 51.

discounts are not immediately liquid and cannot be used to meet the uncertain demands of depositors. It is also a great bulwark in time of bank runs. While strengthening the position of banks, time deposits are a drain on earnings, since interest must be paid on this class of deposits. Banks in financial centers carry large accounts for country banks, which are heavily drawn upon in time of need, and the city bank accepting such accounts must always maintain itself in a far more liquid position than the bank accepting only individual deposits largely on a time basis. Large amounts of certified and officers' checks are frequently found in bank statements. These are segregated from deposits to meet certain calls in the immediate future.

The other items of special interest to investors are the capital stock, surplus, and undivided profits, which represent the stockholders' equity. At the end of 1928 it constituted less than 12 per cent of the total liabilities of member banks. It was less than 18 per cent of deposit liabilities. No class of business corporations trades on such a thin equity as banks. Losses thus fall more heavily upon stockholders than in business corporations. Incidentally, too, this constitutes the dangerous element to depositors.

Bank Stock.—The capitalization of banks is simplicity itself, only common stock usually of \$100 par value is used in the United States. The MacFadden Act of 1927 permits the issue of stock of less than \$100 par value. The complicated pyramiding of the holding company finds no place here. Bank stocks are therefore easily understood. Each bank is an institution which must stand or fall by its own acts. This is true, notwithstanding the fact that identical interests may control several banks, since there is never any organic connection between them.

When one turns from matters of capitalization to the legal position of the capital stock, the picture changes radically. It has already been shown that banking funds are derived largely from deposits. These deposits are debts, the larger portion of which is payable on demand. No other kind of institution is so vulnerable in its obligations. An industrial concern may be an economic failure but, as long as it can earn enough to pay the interest on its bonds, it need have no worries about capital withdrawals. Theoretically, at least, a bank may be called upon to pay all deposits within 30 days' time, which would demand liquidation of, say, one-half to three-fourths of its resources. In such a situation the reason why banks have never been permitted to issue bonds is clear. Banks, moreover, may create current debts without restriction. Emergency borrowing from other banks has always been common and the bank whose affairs are becoming shaky has almost always accumulated a mass of current obligations. The circumstances surrounding banks make it obligatory upon the management not only that it be acquainted with sound banking theory but that it walk the straight and

narrow path of uprightness with a single eye to preserving the resources of the bank inviolate

The double-liability feature in bank stocks constitutes a constant threat against stockholders. Double liability gives the public authorities the power to assess stockholders for an amount equal to the par value of the stock held. It also gives the creditors the power to sue for this amount. Theoretical losses, which in too many cases have become actual, involve the loss of the amount invested in stock plus an assessment equal to par value. This represents the limit of legal assessment. In practice the matter is far worse. So-called assessments, which in reality are only contributions, may be ordered by public authority or by the board of directors to cover losses and preserve the surplus account equal to 20 per cent or even more to reconstitute the legality of loans to individuals permitted to borrow in large amounts. These contributions are practically inescapable, the banks being under threat of closing their doors. Few stockholders have the moral courage to refrain from making these contributions, which in some cases have amounted to 1,000 per cent of the capital stock. These remarks apply specially to the smaller banks of the country. When large banks become hopelessly insolvent, the avenue of escape is through consolidation with larger and stronger institutions (as in Chicago in 1931) or through mutual aid of other banks (as in New York in 1930). In any event, the losses to stockholders are sudden and violent. Supineness of stockholders is warranted only when the bank's affairs are thoroughly open to the light of day and the management is incorruptible. In few concerns does the element of good faith count for so much.

Financial Results—The brokerage firm of Gilbert Elliott and Company at the beginning of 1931 compiled a composite history of 25 leading New York banks stocks, covering the years 1905-1930. These results may be taken as representative of the largest and most successful banks in a metropolitan district. They include the results of affiliate companies where known. The significant results are here reviewed.

For the 26 years covered, these banks earned on an average 10.5 per cent on average book value. The trend has been gradually upward. In the first 10 years average earnings were 9.22 per cent but the last 10 years showed 10.55 per cent. Earnings in years of depression show a decided drop, 1921 showing 6.0 per cent, and 1930, 7.4 per cent. Recuperation from low earnings in the past has been accomplished in one or two years.

The dividend policy has been remarkably stable and shows an upward trend to correspond with earnings. The average rate on average book value for the period was 6.65 per cent. Average ratio of dividends to earnings was 67.3 per cent. In only two years, 1914 and 1921, undivided profits were drawn on for dividends. In 1930 the margin of safety was

14 per cent The percentage of average annual market value of bank stocks to average book value for the period was 1 75 per cent.

Prior to 1926 bank stocks were remarkably stable in price, at no time departing far from the average of about $1\frac{1}{2}$ times book value and never selling at twice book value The average price ranged from 1.19 per cent in 1921 to 1.78 per cent in 1905 From 1926 to 1930 market value averaged 2.90 times book value In 1929 average value was 4.29 times book value and at one time it was 6.08 times book value. This ratio dropped to a low of 1.37 in 1930 The average market value for the entire period was 17.4 times average earnings In the 4 years 1927-1930 average market value was 28.4 times average earnings, reaching the average figure of 35 in 1929, while at one time it was 49.6 times earnings Average dividend yields for the 26-year period averaged 4.15 per cent on average market value. This descended to an average of 1.62 per cent in 1929 and at one time stood at 1.14 per cent Deflation of bank stocks was rather thorough already in 1930. The lowest value was only 1.37 times book value, 18.4 times earnings, and dividend yield was 4.68 per cent Aggregate values dropped 50 per cent in the panic of 1929 and in 1930 to 30 per cent of their highs in 1929.

It may be observed in general that the prices of bank stocks are the result of a subtle and uncertain combination of book value and earnings Never in the 26 years have market values fallen to book values but always a price has been paid for future prospects Perhaps no other industry can make such a good showing even among its leaders Again on account of the high degree of liquidity of bank stocks, it seems logical that market value should have a rather definite relation to book value At times of low prices book values have been a sustaining force, with less attention paid to earnings, while in times of high prices quotations show a decided disposition to leave book values behind and bear a more definite relation to earnings But neither book value nor earnings restrained prices in the recent inflation period and bank stocks were bought at unreasonable prices from whatever point the matter may be viewed

On the other hand, an examination of the status of 65 banks and trust companies in New York, Brooklyn, and Queens at the end of 1930 (including the 25 banks just noticed, but now consolidated into 15) gives a decidedly different impression The stocks of 27 were selling below book value and 13 had deficits in 1930 ¹ The larger banks profited in 1930 by a large increase in the trust business of affiliated banks, while their branches in foreign countries continued to prosper in spite of worldwide depression

Ownership of Bank Stock.—Although the number of stockholders in banks has always been large, the owners have been mostly local capitalists No great amount of public interest was shown in bank stocks until

¹ *Wall Street Journal*, Jan 2, 1931

recent years when a number of banks listed their stocks on the exchanges. Sixteen leading banks and trust companies of New York City showed an increase in stockholders from 21,869 in 1920 to 322,286 at the end of 1931, a diffusion of ownership equaled in its rapidity only by public-utility stocks. In 1920 the stocks of these banks were owned only by the wealthiest people. Reduction in book or par values, combined with a better market, accounts for the change. Bid and asked prices have been much narrower with the improved market.

The University of Illinois Bureau of Business Research investigated the ownership of Chicago State and National Banks as of February 28, 1928.¹ The report of this investigation showed that four-fifths of the total stock was owned by individuals, about one-tenth by trustees and administrators, 3 per cent by investment trusts, and the remaining 2 per cent by insurance companies, educational institutions, and banks. A pronounced tendency to local ownership was revealed. Three-fourths of the state banks show not less than 95 per cent of their stock owned by residents of Greater Chicago. National bank stock is almost equally concentrated. The percentage of stock held outside the Chicago area increases with the size of the bank. About one-third of the stock of state banks is held by directors and about 18 per cent in the case of national banks, a situation explained by the fact that the largest banks are national and the concentration of stock in large banks is generally less than in small ones. Stock appears to be more widely distributed among individuals, especially in the larger banks. In all there were 35,000 stockholders, average holdings being $48\frac{1}{2}$ shares.

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¹ *Bulletin* 23, pp. 32-33.

CHAPTER XXVIII

INSURANCE STOCKS

In the broadest sense, insurance is the distribution of financial losses. At a small cost to each of a group of insured, heavier losses may be indemnified where they fall. Stated in other words, insurance is the indemnification for uncertain financial losses. Insurance thus covers that class of financial risks previously spoken of as unpredictable risks. Not all such risks are yet covered by organizations in the field but the scope of insurance is gradually being broadened so as to relieve the owner of more and more of the uncertainties of life.

Marine Insurance.—The evolution of insurance is the evolution of the application of the principle of indemnity to the various hazards and uncertainties of life. Historically, marine insurance was first, because the amount of property subject to risk at sea greatly exceeded the amount in any other situation and because the hazards of the sea outnumbered those of any other class of risks. Ship-borne commerce could hardly develop beyond the haphazard stage without insurance against loss of both ship and cargo from fire, collision, pirates, thieves, seizures, and the like. Already in ancient times, insurance on bottomry was prevalent and rates were regulated by public authority. The Roman nobility, disdaining commerce as such, invested its money in marine risks. The value of the property was advanced to the owner before the voyage was undertaken so that security was guaranteed the owner. Upon the arrival of the ship at its destination, or its return to the home port, the owner returned the value of the property plus a premium (amounting to 12 per cent in Roman law).

But few records remain of insurance in ancient times. Modern forms of insurance originated in Italy among the Lombard merchants toward the close of the twelfth century. In the fourteenth and fifteenth centuries marine insurance spread to Flanders, Portugal, and Spain. In the sixteenth and seventeenth centuries it made its way to England and the important commercial centers of Europe. The subsequent development of insurance is largely associated with Lloyd's in London which was established by Charles II in the middle of the seventeenth century. At first it was a seaman's coffee house, maintained for the purpose of disseminating shipping information gathered through correspondence with the leading shipping interests of the entire world. The coffee house became the meeting place of shippers and underwriters who gathered there for the transaction of general marine business, including insurance.

It soon grew into the world-renowned insurance organization that still holds a commanding position in the marine insurance field, not only of Great Britain but of the entire world

Marine Insurance in the United States.—In the United States, as elsewhere, the need for insurance arose with the concentration of wealth in ships and goods to be transported on uncertain seas. Personal underwriting was the only form of insurance in the United States before 1800. The private underwriters of Great Britain seem to have exclusively conducted insurance in the colonies as late as 1721. At this time the first insurance office was established in Philadelphia by John Capson for the insurance of vessels, goods, and merchandise. But the merchants of Philadelphia continued throughout the eighteenth century to depend upon the insurance companies of Great Britain. In the meanwhile in New York in 1759, the first marine insurance office was opened and in 1778 the New Insurance office was organized. In both instances wealthy individuals conducted the offices privately.¹ The Insurance Company of North America chartered in Pennsylvania was the first corporation of its kind in the new world. It was soon found that the customers preferred the large and stable corporation to individual insurance. In 1795 the Massachusetts Insurance and Marine Company was organized, in 1796 the Insurance Company of New York was established in New York City, and in 1797 the New Haven Insurance Company appeared. Numerous others were established in different cities within the next 15 years. By 1800, 32 companies had been organized, 10 of which were doing a marine insurance business and the others fire and life. In 1811 Philadelphia had 11 companies, 7 marine, and 1 fire-marine company. In 1825 New York had 12 marine stock companies and Boston perhaps a dozen.²

At the beginning these companies did a flourishing business, but, generally speaking, prior to 1830 the fortunes of these companies fluctuated with prosperity and depression of business. The Embargo and Non-intercourse Acts, the War of 1812, and Napoleonic wars were disastrous to shipping and to the marine insurance business. Large dividends had been paid by the companies and little surplus accumulated to cover these disastrous years. Competition operated to place many of them on an unprofitable basis. But the experience of these years established the necessity for marine insurance among all merchants and owners of vessels. It also marked the practical end of personal underwriting in the marine insurance field in favor of the corporation. Prior to 1840 competitive reductions in rates handicapped all companies, while they ended the life of most of the newer ones.

Between 1840 and 1860, the American clipper ship, superior to all other carriers of the time, placed American shipping on an enviable

¹ *Yale Readings in Insurance Property*, pp. 15-16.

² *Ibid.*, pp. 17-18.

basis and marine insurance in the United States experienced its golden age, standing next to fire insurance in importance. But with the introduction of the iron ship with coal as fuel by Great Britain and the outbreak of the Civil War in this country, the decay of American shipping began and with it the position of American marine insurance. Experience in New York is typical of the entire country. Here altogether about 30 companies were chartered, only 3 of which remained prior to the World War¹. British companies increased their business in the United States often by lowering rates, as American companies declined. Prior to the war 15 important foreign companies transacted business in New York. American marine insurance companies have sought to revive their position, turning to fire insurance, which for most of them is today their chief business. Besides, there has grown up the practice begun by the International Mercantile Marine of self-insurance of vessels, thus obviating the necessity of outside insurance. These companies also insure cargoes on their own vessels.

It may be said that American marine insurance companies "with only a few exceptions have either failed or changed the character of their business."² Unlike fire and life insurance, marine insurance has never been placed upon a scientific basis. Experience alone is the guide in this form of insurance and, as Huebner remarks,

there is no other branch of insurance in which success is so largely dependent upon the native sagacity, the keenness for observation, and the general specialized ability of the individual underwriter to know not only men, but the effect of climate, season, geographical localities and numerous other considerations upon any of a large number of risks, as in marine insurance.³

On the other hand, it is universally recognized that modern trade and commerce would be utterly impossible without insurance coverage.

Fire Insurance.—Fire insurance is a distinct branch of insurance and developed later than marine insurance. It was only after great conflagrations made their destructive visitations upon cities that the necessity for fire insurance was appreciated. It developed in London after the fire of 1666, which was one of the largest in the world and destroyed 80 per cent of the houses of that city with \$10,000,000 losses. Prior to this time ancient communes and mediaeval guilds levied assessments against their numbers to make good the losses within the group.

In 1667 Dr. Nicholas Barbon established individual underwriting on the plan of marine and life insurance companies. Individual underwriting was possible because premiums were large and the amount of the policy small. But the individual method of insuring proved made-

¹ *Ibid.*, p. 23

² *Ibid.*, p. 15

³ *Yale Readings in Insurance: Marine and Fire*, pp. 1-2

quate and Barbon organized a joint-stock company in 1680, known as the Fire Office and later the Phoenix Office. In 1681 the London City Council decided to undertake the insuring of all houses in London and vicinity but abandoned the plan in 1683. In 1683 the first mutual Friendly Society was organized. Forthwith, a three-sided debate arose over the merits of fire insurance as carried on by private business enterprise, by public authority, and by the mutual method. The Hand in Hand (name adopted in 1776) had its origin in 1696 with the establishment of the Amicable Contributionship. These companies one and all confined their insurance to buildings, mostly dwellings.

The need for insuring goods and merchandise was great but had not yet been attempted. In 1706 Charles Pavey, amidst the ridicule of others, established a private office for the insurance of this class of property. His efforts led to the establishment of the Sun Fire Office in 1710, the oldest non-mutual fire insurance company now operating and the first to insure movable and personal property. It has remained a partnership throughout its history. Within the next decade many insurance companies were promoted in connection with the speculative times, culminating in the collapse of the South Sea Bubble in 1720. Needless to say, most of these companies failed. In 1720 the first joint-stock companies, the Royal Exchange Assurance Company and the London Assurance Corporation, were chartered as marine companies, but were authorized in the following year to transact both fire and life insurance.

During the eighteenth century many of the largest of the joint-stock companies of today were organized. Large credit is due to fire insurance companies for having furthered the work of fire protection in Europe as well as in America. They conducted the fire brigades in London until 1866, when the city took them over.

Fire Insurance in the United States.—In the United States in colonial times, little use for insurance existed. Property was not to any great extent concentrated at focal points. At best, property values were small and mutual corporations went far toward restoration of damage by fire. A small amount of individual underwriting existed, but greater success was attained by the companies organized on the corporate basis. As early as 1752 the Philadelphia Contributionship was formed as the first fire insurance company in the United States. Following the American Revolution, the number increased to something like 20 in 1800, among which were the Mutual Assurance Company, formed in 1784, and the Baltimore Equitable Society in 1794. All of these companies operated on the perpetual plan, requiring an initial contribution, the interest and principal of which would give continued insurance. In 1787 the Mutual Insurance Company of New York (in 1846 the name was changed to Knickerbocker) and in 1806 the Eagle Fire Insurance Company were founded.

Most of the early companies were interested in marine insurance but were chartered also to write fire and life insurance. During the War of 1812, fire insurance companies became more popular. After 1812 New York and Pennsylvania prohibited foreign companies from writing insurance within their borders. These laws were not repealed until after the New York fire in 1835. Stock companies appeared in large numbers after 1812 and, by 1820, 26 were in operation. In 1810 the Hartford Fire Insurance Company was organized on the stock plan. The Aetna followed in 1819.

Many stock and mutual companies were organized prior to 1835. In that year, however, the great New York fire bankrupted most of the New York companies and the pioneer period of American fire insurance may be said to have closed.

After 1835 statutes were enacted, the first in Massachusetts in 1837, requiring the calculation of an unearned premium fund for the better protection of policyholders. To this experience also is due the establishment of state supervision over insurance. Public distrust of stock companies led also to establishment of mutuals in large numbers, most of which failed within a short time after organization. After 1835 insurance companies were active in extending their business west of the Alleghanies and after the Civil War to the Pacific Coast. Thus fire insurance gradually transformed itself from a local business with uncertain losses to a more diversified national institution.

Fire insurance was beset by excessive competition during much of its earlier existence. A long step in advance was taken when in 1866 the National Board of Fire Underwriters was organized on a cooperative basis for the control and standardization of rates. Fire maps soon became numerous and the standard policy was first adopted by New York in 1886 and soon afterwards by other states. Later came the development of inspection work, schedule rating, and regulation of fire insurance by state legislatures in matters of valued policy, anti-coinsurance, contract regulation, rates, and taxation.

The Chicago fire of 1871 was disastrous to many fire insurance companies of the country, falling most heavily on the local concerns. Some struggled along till the Boston fire of 1872 completely ended their misery. These disastrous experiences led to advance in rates through the efforts of the National Board of Fire Underwriters. It also led to vigorous opposition to wooden construction. Increased rates and profits brought a flock of new promotions, many of which were irresponsible. The usual excessive competition and reduction of rates developed under these circumstances and the entire business sank to low ebb. Order was gradually brought out of chaos through district and state organizations of field men for the control of rates.

With every disastrous experience of the stock companies, waves of mutuals developed in the fire insurance business. These were succeeded or accompanied by the movement for American Lloyds, which only retarded the development of sound underwriting. However, through a checkered history the stock company has emerged supreme in fire insurance. Although the number of mutual and stock companies is about equal at the present time, the latter transact more than 90 per cent of the total business. Mutual companies are usually smaller and cover less territory.

Recent Experience.—The most recent phase of fire insurance history has just closed. This accompanied financial speculation and inflation from 1925 to 1929. It brought a flood of new companies, more than a hundred, and capital estimated at \$105,000,000. These companies in many cases were organized to take advantage of rising security markets and doubtless received much impetus from the parallel movement in the field of investment trusts. They used the fire insurance business as a means of borrowing additional funds to conduct their investment operations. This is evident from the fact that between 1925 and 1929 approximately \$301,000,000 of new capital came into the industry. It has been estimated that this was three times the normal requirements of the period, the larger portion of which came from stockholders of companies organized prior to 1921.¹ After 1929 a reaction set in, and in 1931 the rate of new capital investment fell almost to nil, the lowest in a decade.

But this influx of new capital for the period as a whole, if confined to the companies already in the field, would have been a strength to the fire insurance business. But the appearance of independent companies in large numbers was possible on account of the modest capital necessary to organize a new company. The fire experiences of the period were exceptionally favorable too. Low capital requirements, exceptionally favorable burning rate, and advancing security markets were responsible for the appearance of the independent companies.

In their scramble for premiums, rates were slashed, expenses and agents' commissions increased, a good share of the business was going to the new companies, 7 per cent of total business in 1929 and 10 per cent of the amount formerly done by the older American companies. Protective measures were undertaken through organization or affiliation among some of the older companies. But profits per dollar of capital invested declined. In the meantime the depression was at work in 1931, eliminating many of the independent companies whose business fell off and whose losses in underwriting and investment greatly exceeded those of the older companies.

¹ See article by G. L. Langreth in *Barron's*, Aug. 17, 1931. This article gives many significant facts on the recent development of finances of fire insurance companies.

Life Insurance.—In its initial stages, life insurance resembled marine insurance. Masters of ships and merchants accompanying their maritime adventures were insured against death, or captivity, at the hands of pirates, in precisely the same way as ships and cargoes were insured. Insurance was little more than a bet on the safe return of the insured. These contracts were written by individual marine insurers as an adjunct of marine insurance. One hears also of children's endowments and annuities of early date as a means of accumulating money and evading the usury laws. In the early times there were also mutual contribution and annuity societies, admitting members on equal terms irrespective of their ages.

But life insurance made little progress before scientific mortality tables were constructed. The first of these in Great Britain was constructed by the astronomer Halley in 1692. Although the Mercers Company was organized in 1698, the precursor of modern insurance was the Society of Assurance for widows and orphans, founded in 1699 by Stansfield. It consisted of 2,000 members each contributing 5 shillings upon the death of a member. This first mutual society contained all the essential conditions of life insurance. A specified age was required, good health a prerequisite, and identification necessary, military, naval, and seafaring risks were excluded. There was also a provision against payment of policies if death occurred within 6 months after becoming a member. In 1706 the Amicable Society was founded by John Hartley as a perpetual society and became one of the famous mutual societies of Great Britain. Many life insurance schemes were promoted in the first two decades of the eighteenth century, just as many marine and fire schemes were. Fraudulent schemes abounded here as a part of the speculative period. Life insurance came to be demanded and, in order to meet the requirement for greater stability, joint-stock companies were promoted for the first time. But the collapse of the South Sea Company in 1720 engulfed all life insurance companies, some 50 in number, excepting only the Amicable. This ended the days of mutual life insurance in England and stock companies entered the field. The London Assurance Corporation and the Royal Exchange Assurance Corporation both were organized in 1721 and obtained the privilege of insuring lives as well as the taking of marine risks. On the whole, however, the events of 1720 set life insurance back a full century.¹ Life insurance did not really gain a foothold until 1762, when the Equitable Society of London was organized on an actuarial basis. This company was remarkably successful. From 1800 to 1820 it insured 151,754 lives.²

¹ On early life insurance in Great Britain, see *Yale Readings in Insurance: Life and Accident*, Chap. VI.

² *Ibid.*, p. 82.

Life Insurance in the United States.¹—In colonial times in America some little life insurance was written on the marine plan in connection with marine insurance companies but it covered only extraordinary risks. Merchants making trips to Europe or the West Indies or to the West were likely to take out a life insurance policy before starting. The rate was the same as in marine risks, namely, 5 per cent of the amount insured and the policy was the joint obligation of several individuals. However, the first company to be organized was the Presbyterian Ministers' Fund in 1759. A similar step was taken in 1769 by the Episcopal Church. The insurance company of North America, chartered in 1794, also did some life insurance business. But the idea of life insurance development came from England when in 1807 the Pelican Life Insurance Company of London established an office in Philadelphia. But the first American Company to mark the real beginning of life insurance in the United States was the Pennsylvania Company for the insurance on lives, organized in 1809 with capital of \$500,000. English practices as to rates and forms were copied bodily. In 1818 the Massachusetts Hospital Life Insurance Company also with \$500,000 capital was chartered. In 1830 came the New York Life Insurance and Trust Company, a stock company, with capital of \$1,000,000. All three of these companies were chartered to do a life insurance and trust business. All subsequently dropped the insurance business and now survive as trust companies.

All kinds of insurance pursued an uncertain course in the United States before the New York fire of 1835. After that the necessity for both fire and life insurance impressed itself upon the public mind. On account of the failure of most of the fire companies after the New York conflagration, insurance turned to the mutual plan in all departments. In the following 25 years most of the leading life and fire companies were organized.

With the chartering of the New England Mutual in 1835 and the Girard Life and Trust Company in 1836, a new era dawned in life insurance in the United States. The New England Company was patterned after the Equitable of London but was required to furnish \$700,000 capital, which delayed its organization till 1843. In the meantime the Girard Company, imitating some of the mutual features of the Equitable, pioneered the way. The mutual plan made rapid progress in life insurance as it did in marine and fire insurance and finally drove most of the stock companies out of existence. In 1842 the Mutual Life of New York was organized and in 1845 the Mutual Benefit of New Jersey. Active competition among these companies developed. Agents were appointed in distant localities, whereupon new companies were fostered in those

¹ For the history of life insurance in the United States, see *Yale Readings in Insurance: Life and Accident*, Chap. VI, by L. W. Zartman.

localities By 1860, 34 companies had been organized on a mutual plan and insurance in force amounted to \$160,000,000

The following two decades were the golden age of life insurance in the United States By 1869 there were 110 companies doing business and insurance in force was about \$1,500,000,000 This wave of life insurance development remains unexplained except on psychological grounds

But unsound insurance practices developed Low rates were charged with notes for premiums and accumulated money was paid in dividends to policyholders and stockholders, regardless of future actuarial needs Life insurance was seemingly the most prosperous industry. Dishonest management frequently crept in. Some 30 companies failed even before the panic of 1873, but this event ended the existence of 41 more before 1877 had closed¹ By 1880 insurance in force had dropped 25 per cent After this, however, recovery was rapid By 1905 there were 5,000,000 policies in force, the result chiefly of the development of the agency system, liberalizing of contracts, and the deferred dividend system

The Armstrong investigation of 1905 revealed negligence of management of many of the large companies. It also found a financial alliance with banks which used insurance funds in large amounts for their own purposes. Insurance companies had acted as participants in financial syndicates, thus diverting attention from the business of insurance Moreover, financial extravagance had become widespread Commissions and salaries were excessive and large sums were spent in legislative lobbying Remedial measures (too extreme in some instances) for almost all of these abuses were speedily enacted Stocks were excluded from investments for insurance funds in the future and those then held were to be disposed of The remedial legislation of 1906 in New York established a standard code which was widely copied by other states Other states passed regulatory laws, establishing commission schedules for agents, controlling new business budgets, surplus, policy, dividends, publicity, and the like Standard policies with limited amounts of insurance on individual lives have also been prescribed by the insurance companies

Present Status of Life Insurance.—After 1906 life insurance entered a period of uninterrupted prosperity. Many new companies were organized in all parts of the country But many of these were little more than promotion schemes and stockholders lost heavily Neither the World War nor the influenza epidemic of 1918 had serious results for the well-established companies At the present time a high degree of efficiency of management exists and public confidence is genuine There are almost 30,000,000 ordinary, and over 85,000,000 industrial, policies in force The former represent about 80 per cent and the latter

¹ *Yale Readings in Insurance Life and Accident*, p 89

20 per cent of the \$100,000,000,000 insurance now in force The capital stock of companies increased from \$12,832,000, in 1900 to \$149,471,000 in 1928 ¹

Surety and Fidelity Insurance.—There are instances of early fidelity insurance in England by private individuals The first company to operate in this field, however, was organized in 1840 In the United States the business began about 1880, although legislative authorization in New York goes back to 1853 In 1884 the American Surety Company was organized and is still one of the stronger companies in this field of insurance In 1890 the Fidelity and Deposit Company of Maryland was started This type of insurance has recently made rapid progress in the United States In 1929 over \$100,000,000 premiums was paid for surety and fidelity policies.

Credit Insurance.—Credit insurance originated to protect manufacturers and wholesalers against exceptional losses in their credit operations Companies already in this field were legally authorized in New Jersey, New York, and Louisiana in 1885 and 1886 In 1889 the United States Credit System Company of New Jersey was organized and, in 1891, the American Credit Indemnity of Louisiana (incorporated in 1893 in New York) In the nineties the London Guarantee and Accident Company and the Ocean Accident and Guarantee Company began to write business in the United States Credit Insurance is written by companies mainly as an incident to surety and fidelity business.

Automobile Insurance.—Automobile insurance was first undertaken by the Boston Insurance Company in 1902 It has developed along with the use of the automobile since that time Its dominant form is insurance against liability for injury to others or damage to property of others But large amounts are spent for protection against injury to the owner or damage to his car through collision and fire Protection against theft is also common Liability insurance is carried by about one-third of the car owners at the present time and by about one-half against fire and theft, while collision insurance covers only about 15 per cent of the cars.

Data covering casualty, and miscellaneous stock insurance companies show that the total number of companies increased from 57 in 1900 to 358 in 1928, and capital and surplus from \$50,631,000 to \$625,736,000 Assets at the present time stand at about \$3,000,000,000 ²

Finances of Insurance Companies.—The finances of insurance companies are appropriately divided into (1) insurance operations and (2) investment operations ("banking operations" of the trade) Insurance operations have to do with the scientific calculation of premiums in amounts necessary to cover losses on risks assumed and to pay expenses

¹ Data from *Statistical Abstract of the United States, 1930*

² *Statistical Abstract of the United States, 1930, p. 311*

and taxes This amount emerges as the individual or class rate which the insured has to pay for his protection In life insurance actuarial science has arrived at great accuracy in the calculation of losses, but in fire insurance a margin of error of 2 to 3 per cent is regarded as a high degree of accuracy This is because the burning rate itself is not uniform from year to year and also because the cost of construction and valuation of property change Losses in the pre-war period were less than one-half what they were following the war, owing to the higher values placed upon property in the inflation period A tendency of losses to vary inversely with general business conditions is also observable A considerable degree of correlation exists between business failures and fire losses, due in part doubtless to the moral hazard which varies inversely with the fortunes of business Within recent years fire losses in proportion to property insured have shown a tendency to decrease Better construction and fire prevention campaigns doubtless have an influence in this direction

Loading for Expenses and Taxes.—The second item included in the premium charge is loading for expenses incurred in the general offices of the companies, adjustment expenses, and the like In the early days of marine insurance, agents' commissions amounted to only 15 per cent or less of the premiums received They rose gradually to about 21 per cent in 1900. No decided advance from this figure was noted until after the war, when agents' commissions advanced materially and now stand at approximately 25.5 per cent of net premiums written (total premiums less reinsurance premiums and cancellations)

Insurance companies are subject to a variety of taxes and fees Fees are paid insurance departments of states for agents' and company licenses, for filing of documents (in some cases with the secretaries of state) Fees are also sometimes paid to local communities for agents' and company licenses Sometimes states require insurance companies to pay the expenses incurred in public examination of insurance affairs Besides these, are taxes upon property held by the company and a percentage tax, commonly 2 per cent, on premiums collected within the state, deduction being allowed in some cases for fees collected. Lastly there are the federal income and corporation capital-stock taxes. In 1928 taxes and fees amounted to 3.88 per cent of net premiums written Office and adjustment expenses account for the balance of expenses These items have shown a decided tendency to advance since the war. In 1918, 11.78 per cent of net premiums written was thus accounted for, by 1928 the proportion had advanced to 16.85 per cent The percentage of total expenses (including taxes) to net premiums written advanced decidedly between 1918 and 1928, the figures being, respectively, 39.02 and 46.30 per cent ¹

¹ *Insurance Yearbook*, 1929 Fire and Marine, pp. A-49, A-51.

In all types of insurance, except life, premiums are calculated without consideration of income from investments. This is because the term of the policy is short, 1 to 5 years, typically 1 or 3 years in fire insurance, and because the losses cannot be predicted exactly, as in the case of life insurance. A margin of error of 2 to 3 per cent is necessary. After paying agency expenses (averaging about 25 per cent) and office expenses (averaging about 5 per cent) in writing a policy, there remains about 70 per cent of gross premiums available to the company. This is received after the customary 60-day period allowed agents for paying premiums to the company. Losses, if spread uniformly over the year, will be about 4 per cent per month and expenses and taxes about 2 per cent. The net result is that 70 per cent of gross premium income may be invested on the average about 6 months per year. If 5 per cent be allowed for interest, the rate then would be only $2\frac{1}{2}$ per cent per annum, which just about equals the margin of error. Interest on investment, therefore, is needed to cover the probable error in loss experience. It appears that there is little or no profit from underwriting and this is the experience of most companies. It is only the exceptional company that can show a profit from underwriting.

Underwriting Profit and Loss.—Unfavorable tendencies in the expense accounts of fire and marine insurance companies have been noticed. But this tells nothing concerning the situation with reference to profit and loss on underwriting. In order to understand insurance profit and loss, it is necessary to explain briefly insurance accounting as required by law. A distinction is made between earned and unearned premiums. Assume a 1-year fire policy for illustration, and that policies are written uniformly throughout the year, also that premiums have been received uniformly. Policies in force will increase gradually to the end of the year, when the maximum amount is in force. Expiration of the policies written will be just as gradual during the following year, so that premiums collected during the first year will have to be drawn on throughout the second year to pay losses. Assuming the burning rate to be uniform for the 2 years, at the end of the first year losses will have been exactly one-half covered and the company, therefore, earned just one-half of its premiums received during the year. The premium income for the year is, therefore, twice the earned income. One-half of the premiums received would be earned premiums and one-half the unearned premium reserve. When policies extend over a longer period, the earned premiums will be such a percentage of the total premiums received as the period of loss already covered bears to the entire period covered by the policies. For 3-year policies, at the end of the first year only one-sixth of the premiums received will be earned and five-sixths unearned. At the end of the second year three-sixths will be earned, at the end of the third year five-sixths, and at the end of the fourth, six-sixths.

This forms the basis for profit and loss calculation. The formula for a year's results runs as follows: To the net premiums (gross premiums less return premiums and reinsurance items) written during the year, add the unearned premium reserve on policies written in previous years, as of the beginning of the year, from which subtract all unearned premiums at the close of the year. From this total subtract fire losses and expenses paid and incurred during the year. The remainder is the underwriting profit or loss.

Underwriting results have been calculated for 290 American and foreign stock fire and marine companies for the period 1921-1925.¹ In this period 206 companies lost \$130,600,000 and 84 companies made \$28,300,000, a net loss of \$102,300,000. Only 1 of the 17 largest companies made a modest profit on underwriting business, while 16 of these lost \$39,800,000. The four largest companies, each with over \$50,000,000 of assets, all incurred heavy underwriting losses. This experience is confirmed by records of the members of the National Board of Fire Underwriters. In the period considered, the percentage of fire losses to net premiums earned averaged 58.52, expenses 45.58, total 104.10. Since then, decided improvement has been shown. The period 1926-1928 showed, by way of comparison, fire losses averaging 49.77 per cent of earned premiums, expenses 46.57 per cent, total 96.34 per cent.

Investment Operations.—The other phase of insurance finance, namely, investment operations, is of great significance in the profit and loss statement. It not infrequently happens that companies showing an underwriting loss, after covering these losses, have a net profit on their investment operations. As has been seen, most companies in the period 1921-1925 had to depend upon the investments to cover underwriting losses and for profit on the capital employed in the undertakings. Income from investments is usually divided into interest, dividends, and rentals, on the one hand, and profits from sale of securities or real estate, on the other. Needless to add, the latter may result in loss instead of profit. The funds available for investment in a fire insurance company are secured from the capital stock, the surplus, and the unearned premium reserve.

The investments of fire and marine insurance companies differ from those of life insurance companies in both content and policy. While life insurance companies have a large amount of their assets tied up in real-estate and farm mortgages and bonds, fire and marine and casualty companies have pursued the policy of investing largely in stocks and bonds. At the end of 1928 fire and marine insurance companies of New York State showed 55 per cent of all investments in stock and 39 per cent in bonds.² Mortgage loans constitute between 1 and 2 per cent

¹ S. H. NERLOVE, *Journal of Political Economy*, February, 1927.

² *New York Insurance Report*, 1930. Fire and Marine, Part I, p. 16.

of total assets The assets of fire and marine stock companies doing business in New York at the close of 1929 are shown by the following table.

TABLE 62—ASSETS OF FIRE AND MARINE INSURANCE COMPANIES OPERATING IN NEW YORK
(December 31, 1929)

Assets	New York stock companies, thousands	Other stock companies reporting to New York, thousands
Real estate	\$ 5,903	\$ 30,738
Mortgage loans	14,266	60,334
Bonds and stocks owned	909,541	1,014,337
Call loans	6,258	4,099
Cash	80,122	81,218
Premiums uncollected	60,002	78,654
Miscellaneous assets	7,867	14,401
Total admitted assets	1,083,959	1,283,781

New York Insurance Report, 1929 Fire and Marine, Part I, p. 20

The investment policy of fire and property insurance companies differs radically from that of life insurance companies. The latter regard their investments as permanent, since the normal expectancy of life is far in the future. Most bonds and mortgage investments of these companies are held to maturity and the income from them is therefore subject to exact calculation. This makes it possible for premiums to be calculated with certainty and exactness, since income from investments enters into all premium calculations of life insurance companies. But fire and marine and casualty insurance companies write policies for shorter periods of time, often 1 year, typically 3 years, and generally not over 5 years. Since income from investments forms no part of their premium calculations, they are free to pursue whatever investment policy the management deems expedient. As a result, these companies have looked upon their investments as temporary and count on turning over their portfolio rapidly to obtain trading profits. In fact trading profits have constituted the main source of their revenues. Figures have already been quoted showing the enormous profits from this source between 1921 and 1925.¹ Capital and surplus must be large in proportion to total assets in fire and property insurance in order to give protection to policyholders where losses are rather uncertain at best. New York fire and marine stock

¹ Fire and marine insurance companies may be called the original American investment trusts. We hasten to add, however, that they differ radically from the British type of investment trust in their trading characteristics.

companies in 1928 showed 16½ per cent of assets covered by capital stock, 38.2 per cent by surplus, and the balance 45.3 per cent by premiums.

In the investigation of the 290 companies above referred to for the period 1921-1925, investment income totaled \$158,750,000 or \$56,450,000 in excess of net underwriting losses. Investment income of the 17 largest companies was \$18,850,000 in excess of net underwriting losses. Besides income from interest, dividends, and so forth, the 290 companies showed profit on sale of ledger assets plus increase in book and market value of assets (mostly securities in both cases) of \$486,000,000, which was over three times the income. The 17 largest companies made \$177,600,000 in this way. The Continental and Home Companies were the most successful in investments. Never did borrowing from the public on a large scale (net cost of which is estimated to have been something like 2.5 per cent per annum) prove so profitable to the borrowers.

Assets.—Assets of insurance companies, like those of banks, are largely liquid in character. They resemble assets of banks, too, in that hidden assets may exist to a considerable extent. This results largely from the practice of insurance departments in excluding certain assets unsuitable for protection to policyholders. Among these, furniture and fixtures and supplies are almost universally excluded. Questionable paper may also be excluded from the "admitted assets," while real estate is limited by the needs of the company. Aside from these peculiarities all insurance companies, except life companies, are almost entirely free in the choice of their investments. In fire companies about 84 per cent of the total assets is invested, while in casualty companies investments amount to only about 79 per cent. The investment assets of a fire company, however, on the average will be made up only of about two-thirds capital and surplus and one-third premium reserves. In addition to investments they have a small amount in call loans (less than 1 per cent at the end of 1929). Insurance companies resemble banks with fluctuations in demand of customers for money. From 6 to 7 per cent of total assets of fire, marine, and casualty companies are constantly in cash. About 6 per cent additional in fire companies is premiums in process of collection, 60 days being the usual allowance to agents for payment of premiums. In casualty companies this amounts to about 10 per cent. In the operation of their business it is found that, as a matter of policy, large amounts of cash are constantly kept on hand to meet uncertain and irregular losses.

Even to a larger extent than in property insurance, the assets of life insurance companies are composed mostly of investments. The laws of most states restrict holdings of real estate except for office accommodation. Formerly public administrative authorities would permit investment in real estate only for office needs. But within recent times a more liberal attitude has developed and insurance companies may now

erect office buildings which fully utilize site values and rent the excess floor space

In valuing real estate, no set formula has been followed. The commissioners, however, lean toward conservatism and buildings are frequently reduced to only fractions of their real value. This is a prolific source of concealed values and it reduces the surplus account below its real worth. The real-estate item is likely to contain property taken in or foreclosure of defaulted loans. The amount of this cannot always be determined from published reports. But when the item shows variations from year to year, it is usually on account of the change in real estate acquired through foreclosures.

Life insurance companies keep only a small percentage of their total assets in cash, since current premiums almost invariably exceed all cash disbursements.

The investments of life insurance companies are strictly regulated by the laws of the various states. While the details of these regulations are endless, the general tendency is to confine investments to securities of sterling worth. The list includes obligations of the United States, of states, and municipalities. It also commonly includes railroad bonds of the best grade, real-estate mortgages, especially those on real estate within the home state. Within recent years public-utility bonds of high grade have been admitted also and in some cases a limited amount of stocks is included.

In the case of fire companies the policy of investing in stocks has been followed quite generally. Many companies have upward of 40 per cent of their investments in stocks. These suffered severely, however, in the depression of 1930-1932, 20 of these companies showed a depreciation of 19.12 per cent in the value of security holdings in 1930, while 43 companies with less than 40 per cent of their assets in stocks showed only 6.95 per cent depreciation.¹ The year 1931 was doubtless far more disastrous to the first group of companies on account of the more severe depreciation of stocks during that year.

American life insurance investments have been largely in corporation bonds and real-estate mortgages. A detailed statement of investments of 52 leading life insurance companies, holding 91.6 per cent of the assets of all legal reserve companies in the United States, for the years 1906 and 1931 shows the present distribution and significant changes in the past 25 years. The most significant change in this period was in railroad bonds. Although the amount of railroad bonds held in 1931 was almost three times as great as in 1906, the percentage of the total investment dropped from 35 to 16. Other mortgages, mainly real-estate mortgages, show the largest increase in both absolute amount and percentage of

¹ *The National Underwriters*, Aug. 31, 1931.

the total Public-utility bonds and stocks also show decided advance in both amount and percentage of the total.

TABLE 63 — INVESTMENTS OF 52 LEADING LIFE INSURANCE COMPANIES
(In thousands)

Securities	1931	Per cent	1906	Per cent	Increase
U S Government	\$ 395,000	2	\$ 2,900	1	\$ 392,100
Canadian Government	446,000	2	22,214	8	423,786
Collateral loans	18,000	1	51,678	2	33,678 ¹
Other foreign governments	31,000	2	64,997	2	33,997 ¹
Cash	145,000	8	65,040	2	79,960
State, county and municipal	728,000	4	103,789	3	624,211
Other bonds and stocks	611,000	3	107,777	4	503,223
Public-utility bonds and stocks	1,856,000	10	134,056	5	1,721,944
Real estate	519,000	3	156,442	5	362,558
Policy insurance and premium notes	2,943,000	16	254,815	9	2,688,185
Farm mortgages	1,846,000	10	268,658	9	1,577,342
Other mortgages	5,249,000	28	551,864	19	4,697,136
Railroad bonds and stocks	2,986,000	16	1,001,728	35	1,984,272
Other admitted assets	727,000	4	90,529	3	636,471
Total	\$18,500,000		\$2,876,487		\$15,623,513

Compilation of W A Law, President of the Penn Mutual Life Insurance Company.

¹ Decrease

Some pronounced changes have taken place within the past 10 years. Admitted assets increased from \$7,111,000,000 in 1923 to \$16,070,000,000 in 1931 (August), or 124.5 per cent. In the same period farm mortgages lost relatively, increasing only 32.4 per cent, other mortgages gained 265 per cent, government bonds only 1.1 per cent, railroad bonds, 56.5 per cent, public-utility bonds, 541.1 per cent; and policy loans, 166.1 per cent. The recent depression brought about an absolute decrease in farm mortgages and an unexampled rise in policy loans. Policy loans and premium notes amounted to \$2,943,000,000 at the end of 1931.

The problem of valuing stocks and bonds has always been troublesome in making out balance sheets of insurance companies. Generally, public authorities have required the rule of market value as of the date of the statement. But in times of distress such as 1907, 1914, and 1930 and 1931, arbitrary rules have been substituted, these are generally based upon some average of market value for the preceding year or more. All market values are unjust in valuation of insurance assets. At best, market values are temporary, while insurance companies, especially life insurance companies, have contracts continuing far into the future and will never be called upon to meet all future liabilities at any one time.

The valuation based upon market quotations results in violent changes in surplus accounts, so that it becomes impossible to ascertain the true position of the stockholder

In normal times the stocks of fire insurance companies sell in excess of their liquidating value. This is because earnings are relatively high. Fire and casualty companies which invest heavily in stocks suffer severely during periods of financial disturbance. On June 30, 1931, the stocks of 35 leading fire and casualty companies were selling on the average at only 71 per cent of their liquidating value. Almost all of these were paying a regular dividend and the average yield at market price was 7.40 per cent. Some of the weaker companies which invested heavily in stocks showed extraordinary deflation in 1931. As an example of this (not the most extreme), the National Liberty Company sold at a high of \$39 in 1929 but dropped below \$5 in 1931, its liquidating value was approximately \$6 per share and on the current dividend rate yielded 8.51 per cent on the market price.

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CHAPTER XXIX

INVESTMENT TRUSTS

Early Investment Trusts.—Perhaps the earliest investment trust was formed by King Wilham of Netherlands at Brussels in 1822, it afterwards became the Société Générale de Belgique. This society was organized to invest in foreign government bonds on the principle of diversification of holdings.¹ Several investment trusts also appeared in the first half of the nineteenth century in Switzerland, where some of these institutions have continuously maintained themselves.

English Experience.—In England the investment trust was born out of the desire of the middle classes to obtain more than the ordinary yield on high-grade investments with equal safety. In 1822 the "Navy Five Per Cents" were converted into issues bearing only 4 per cent. For the next decade foreign government and city bonds were floated in the London market to the extent of £50,000,000 (some of American origin) and sold largely to the middle classes. Two-thirds of these obligations were soon in default. This experience was followed by the boom and crash in railroad securities during the eighteen hundred forties, again subjecting the public to severe losses. Investments were made without sufficient information and rather indiscriminately. Thus the middle classes for a quarter of a century, in their efforts to obtain higher rates on their investments, met only severe reverses. In this situation they sought better guidance from the upper classes.²

The instrument for rendering this service materialized in 1863 in the formation of the first two investment trusts in England, the International Financial Society and the London Financial Association. These were soon followed by other similar associations. In the prospectus of the Foreign and Colonial Government Trust, organized in 1868, it is stated that the purpose of the trusts was "to give the investor of moderate means the same advantage as the large capitalists." The plan of these early trusts embraced the two fundamental ideas of management trusts, namely, the services of superior management and the diversification of holdings. The latter was accomplished by investing in various classes of domestic and foreign securities³ from the long-run point of view.

¹ T. J. GRAYSON, *Investment Trusts*, p. 11.

² See L. M. SPEAKER, *The Investment Trust*, pp. 8-10.

³ E. T. POWELL, *Evolution of the Money Market*, pp. 468-469.

These early associations were organized under the common law. In 1879 the courts declared this form illegal and since then they have been organized under the Companies Act of 1862.

The period of the eighteen eighties saw the first development on a large scale. In 1880 and again in 1889 the British Government reduced the rate of interest on the Consols, which caused English investors to seek larger returns in foreign investments, chiefly of the United States and Argentina. Between 1884 and 1890 there was an epidemic of investment trusts.¹ Literally scores of new trusts were organized in the later eighteen eighties. All sought higher returns through better management.

The next few years were disastrous to this movement. The failure of the most conservative and important banking concern, the Baring House, in 1890, followed by the panic of 1893 in the United States and the crisis in Argentina, reduced security values to fractions of their former figures and utterly destroyed all confidence in high-yielding investments at home and abroad. As a result of these events the trusts were left with worthless securities on hand and 80 per cent of them failed.² Failure of the trusts was due to several specific causes. They became speculative in character, entering the promotion and underwriting business. In addition, the managers exploited them; "fully paid" founders' shares were distributed to the managers; and after the crisis new trusts were frequently formed in order to "dump" personal holdings at artificial values.³

By 1896 the better trusts were back in public favor. They eliminated objectionable practices and standardized their methods of investing. They established reserves out of income and profits on the sale of securities, the same being held as protection against future declines in value. A policy of full publicity was instituted, including a list of holdings at least once a year.⁴ Since then the British trusts have had a successful experience. They weathered the crisis of 1907 and the war period without serious losses. Within recent years their character has somewhat changed. They are now looked upon not as institutions for vicarious investment but more as a power in the money market. It has been said of the investment trust of today that "it watches the market, changes its investments, gets out of this and into that as the economic or political ebb and flow suggests."⁵ Its operations include extensive underwriting.

The leading characteristics of the British trust at the present time are summarized by Grayson as follows. (1) they make a profit by invest-

¹ *Ibid.*, p. 469.

² *North American Review*, Vol. 229, p. 52.

³ *SPEAKER*, *op cit*, pp. 15-17.

⁴ J. E. FOWLER, JR., *American Investment Trusts*, pp. 3-4.

⁵ *POWELL*, *op cit*, p. 476.

ing and reinvesting through expert managers, (2) their borrowings are restricted to the amount of their capital stock, (3) the employment of funds is restricted according to type of business or security and geographical location; (4) control of any company whose securities are held as investments is restricted

The average number of issues held is about 445; one shows 900, but another only 17. Bonds and stocks are held in about equal amounts. Portfolios are changed over a period of about 5 or 6 years. From 30 to 40 per cent of their holdings are in domestic enterprises. The tendency is to classify holdings as (1) government securities, (2) domestic enterprises, (3) colonial securities, and (4) South American investments.¹

The earnings of the British trusts are derived from (1) interest and dividends, (2) syndicate operations, (3) trusteeships, secretaryships, and registrarships, and (4) sale of securities.

American Investment Trusts.—It appears that some 11 organizations in the United States functioned as investment trusts prior to 1920. The first of these was possibly the Boston Personal Property Trust, a "common-law" association organized in 1893.² Priority in "investment trusts" is usually assigned to the Overseas Security Corporation, established in 1920 with \$2,000,000 capitalization (dissolved in 1923). The real leader of the later trusts, however, was the International Securities Trust of America formed in the same year.³ Once started, this form of organization grew very rapidly even before the palmy days of 1928 and 1929. By 1927 something like 150 were in existence with capitalization of \$700,000,000.⁴ The growth in 1929 and 1930 was of the true mushroom variety. In the former year new financing amounted to \$1,866,941,000.⁵ In 1930 over 200 were launched, bringing the total to 608 by the end of the year.⁶ The total invested capital of these institutions probably reached \$5,000,000,000 in all.

Types of Trusts.—American investment trusts have not reached a degree of standardization sufficient for rigid classification. However, if the term is interpreted broadly, analysis according to economic and legal characteristics yields four fairly definite types.

Management Trust.—The first is the management or British type. This type of trust is usually organized in the corporate form and issues its own stocks and bonds, the proceeds from the sale of which are invested in securities at the discretion of the management almost without restriction—except for limitations such as provide for a certain degree of

¹ GRAYSON, *op. cit.*, pp. 83-84.

² FOWLER, *op. cit.*, p. 4.

³ *Idem*.

⁴ *Idem*, p. 6.

⁵ *Keane's Investment Trust Monthly*, January, 1930.

⁶ *Keane's Investment Trust Manual*, 1930.

diversification either as to enterprise, type of security, or geographical distribution. As in the British type, the two leading characteristics of this type are superior management and diversification of holdings. Examples of this type are the subsidiaries of the American Founders trust, National Investors, American International, and Adams Express (a joint-stock association). A special variety of this type is the specialized management trust. This differs from the general type in that diversification is limited to the securities of a single industry, as, for instance, Aviation Corporation, Insuranshares, and Oil Shares.

Investment Fund Trust.—A second type is the investment fund trust, which issues certificates of participation instead of stocks and bonds. Through these certificates the holders have an equity in the securities of the trust themselves and not merely an interest in the organization as a distinct personality. Examples of this type are the Investment Manager's Company of New York and Incorporated Investors.

Fixed Trust.—A third type is the so-called "fixed" or "bankers' share" trust. This is similar to the second type in that participating certificates of ownership are issued which carry the right of conversion into a proportionate part of the underlying securities of the trust. After allowing for expenses of transfer, this insures that the market price of the certificates will be equal to the market value of the underlying securities. These trusts differ from the investment fund type in that the portfolio is fixed in some 25 or more selected stocks. Elimination of any particular stock can be accomplished only with difficulty, usually after the lapse of some time, usually after dividends have been dropped (100 days in case of the North American Trust Shares), whereupon the proceeds from sale are distributed *pro rata* to the certificate holders.

The certificates carry coupons which entitle the holders to their proportionate share of the distributions on the underlying shares. Definite minimum guarantees as to income are sometimes made, against which a reserve fund is built up. Certificates are issued continuously, whereupon the specified stocks are acquired on the market at the current price which with an additional amount for expenses constitutes the offering price to the purchaser. The underlying securities are deposited with a trustee for safekeeping. These trusts run anywhere from 2 to 20 years, or more. Examples of this type of trust are North American Trust Shares and Diversified Trustee Shares. The portfolios of these trusts are usually selected from well-seasoned dividend-paying stocks of American corporations of a diversified kind. These trusts suffer the criticism of inflexibility. Elimination of securities is difficult so that large losses may result, while no new securities may be added. The holder ties up his funds for an indefinite period of time, unless, indeed, he cares to sell his certificates, which may be done only at considerable shading of price, since the spread between bid and asked prices is generally

75 cents or more per share. Since the shares are usually low priced, the spread may amount to as much as 10 to 15 per cent of the value.

The Finance Company.—The fourth type of trust is the finance or promotive trust. The finance holding company is usually organized to control certain subsidiary corporations operating in a given field. It sometimes acquires the preferred stocks or bonds of the subsidiaries along with the common stocks to stabilize its income. In order to get a measurable degree of diversification, it frequently acquires stocks and bonds or other corporations purely on an investment basis. Nevertheless, it is seldom that these trusts secure a well-balanced diversification of their portfolio. They are frequently indistinguishable from the specialized management type, except for their interest in controlling the underlying corporations. The very purpose of these organizations in securing control of other corporations makes it doubtful as to their admission to the category of investment trusts at all. The investment trust aims at income and appreciation of principal in the interest of the investor upon a reasonably certain basis. But the securities of finance companies are likely to be common stocks with little earning power behind them. The management has full discretion in its activities. These corporations are likely to issue bonds and preferred stocks as well as common stocks. Examples of the finance company are American Super-power Corporation, Alleghany Corporation, Pennroad Corporation, and Utility and Industrial Corporation.

Experience of the Trusts.—Experience of American investment trusts of the management type during the depression of 1930–1932 was similar to that of their British prototype in the early eighteen nineties. Scores of these trusts were literally wiped out, the investors losing heavily. The asset values of those remaining shrank fearfully. In the year 1931 alone, 139 companies reporting the market value of investments showed a decline from \$2,126,939,876 at the beginning to \$1,083,578,977 at the end of the year—approximately 50 per cent. The net income of 150 companies declined from \$86,661,416 at the beginning to \$50,398,376 at the end of the year, a decline of almost 42 per cent. The return on the invested capital of these companies in 1930 was 3.32 per cent and in 1931 it was 2.77 per cent. The latter figures ignore trading losses, which amounted to more than four times the net income in 1931. Realized losses on the sale of securities of these 150 companies showed \$226,711,827 in 1931.¹

Accounting Methods.—The large losses of the past few years have compelled the trusts to change their methods of accounting. Formerly profits from sale of securities were included in the net income for the year, along with interest and dividends, frequently with no separation of items so that the public was in the dark as to the sources of income. Many

¹ See article by Henry E. Hansen in *The Analyst*, Apr. 15, 1932.

companies now carry both profits and losses from sale of securities to capital surplus account or to a special reserve account, so that the income on the underlying securities constitutes almost the only source of income. This avoids capitalizing the profits from trading and pyramiding of values—a practice which accounted largely for the enormous inflation of the prices of investment trust stocks in the boom days of 1929. The Committee on Listing of the New York Stock Exchange favors the elimination of all profits and losses from security operations from the income account and the carrying of them to a designated reserve or special surplus account, the same not to be regarded as available for regular dividends. Profits may be later distributed in stock dividends if so desired.¹

Abuses of Trusts.—The suddenness of the development of American investment trusts brought the usual excrescences of rapid growth. In a report of the attorney general of the State of New York to the legislature dated March 5, 1932, some of the abuses of trusts were exposed. In this report 100 trusts with asset values of \$1,906,800,000 on June 30, 1931, were considered with reference to violations of the Martin Act. The attorney general stated that 56 of these trusts were open to criticism and 19 were to be prosecuted.

The most serious evil found was “dumping” of securities of corporations in which the trust directors or sponsors had an interest at prices unfair to the trust security holders. In four companies with total securities of \$279,744,000 as much as \$203,059,000 was dumped. A second evil was the borrowing and loaning of funds, in some cases as high as sixteen times the capital stock and surplus. Officers and directors borrowed trust funds without much security. Corporations with the same officers or directors as the trusts also borrowed freely. Only 40 of the 100 furnished complete data on their financial condition or holdings. Some failed to separate “paid-in surplus” from “earned surplus” or “undivided profits.” In only a few instances were the sources of income revealed. Stock dividends were sometimes credited to income. Dividends were sometimes overpaid, while capital or surplus was impaired by depreciated securities. Shares of the trust were repurchased out of capital instead of from surplus. Numerous trusts were affiliated with brokerage houses or banks which resorted to marginal transactions and excessive loans to the trusts. These practices were said to be “widespread.”

Financial Policy.—Some of the firmly established investment trusts have carefully restricted the management in its financial operations. For instance, the Second International Securities Corporation has the following regulations: (1) the corporation shall not engage in any promotion, business management, or business financing, except in underwriting, but must confine its operations to readily marketable securities; (2) the corporation shall own at least 400 different securities, (3) no more

¹ *Idem*

than 35 per cent of the trust's funds shall be invested in securities originating in a single foreign country, (4) investment in securities of any one governmental authority, investment organization, bank or insurance company, except the United States or Great Britain, shall not exceed 5 per cent of total funds, and not more than 3 per cent may be invested in the securities of any other one obligor or issuer, (5) investment in each of the following classes must not exceed 25 per cent of the total funds. banking institutions, insurance companies, investment organizations, railroad companies, and not over 12½ per cent in any other "distinct class" of business or industry; (6) the extent of underwriting operations is limited with respect to concentration of funds in one underwriting and with respect to "current resources"; (7) investment in any one issue is limited to 20 per cent of the total issue, and (8) funds shall not be loaned except upon collateral whose market value is 25 per cent in excess of the loan at the time it is made. No loans shall be made to any person, firm, or corporation that owns a majority of the shares of any class of its stock or to any corporation or association, a majority of any class of whose stock is owned or controlled by any person, firm, or corporation.

The investments of the Second International Securities Corporation on November 30, 1928, on a cost basis showed 50.62 per cent in bonds, approximately one-half of which was in government and municipal bonds and the balance mainly in transportation, public utilities, and industrials, 3.28 per cent was invested in preferred and 37.51 per cent in common stocks, industrials accounting for 19.82 per cent of the latter, 8.58 per cent was in cash. The geographical distribution of the holdings of this same corporation was as follows.

	Per Cent		Per Cent
United States of America	14.73	Eastern Europe	4.28
British Commonwealth of Nations	12.89	Japan and other Asiatic countries	6.46
Central and South American	2.66	Cash	8.58
Western Europe	8.85		
Central Europe	41.55	Total	100.00

Outside of comparatively few organizations, American investment trusts can scarcely be said to have a settled financial policy. In practice almost any imaginable policy may be found. It may be said, however, that, generally speaking, common stocks have formed the principal part of their portfolios and of these the stocks of industrial corporations have been the principal reliance, with railroads or utilities coming second. This preponderance of common stocks is doubtless a reflection of the times during which most of the trusts were born. The unparalleled bull market of 1928-1929 with its prospects of quick profits was irresistible to the trusts. Nor did the events of 1930 and 1931 materially change this picture. Investment trusts, like individuals, have increasing faith

in the common stocks of American corporations. However, there has gone on a process of selection among these issues themselves, with the elimination in many cases of large amounts of railroad, mining, oil, and bank shares. Speculative stocks in general have been reduced, while those offering investment yield have been substituted.¹ The 20 most popular stocks held by investment trusts at the close of 1931 in order of popularity were as follows.

- | | |
|--------------------------------|-------------------------------|
| 1 Consolidated Gas | 11 American Can. |
| 2 American Telephone | 12 Borden |
| 3. Drug Incorporated | 13 United Light and Power |
| 4. General Motors | 14 American Tobacco |
| 5 National Dairy Products | 15 Electric Power and Light |
| 6 Public Service of New Jersey | 16 Southern California Edison |
| 7 American Gas and Electric | 17 United Gas Improvement |
| 8 Pacific Gas and Electric | 18 Kennecott Copper |
| 9 General Electric | 19 United Corporation |
| 10 Union Carbide | 20 Chesapeake and Ohio |

The number of securities held by the different trusts varies widely. Some, operating on the principle of wide diffusion of risk with less emphasis upon selection, include several hundred issues in their portfolios. Examples of this policy are the American Founders group, the American International, and Adams Express. Others prefer to exercise more selective choice and include only 20 to 40 issues. Examples of this policy are found in the subsidiaries of National Investors and in Incorporated Investors. They frequently shift their holdings to correspond to changing prospects of stocks. This represents the most ambitious policy of all, the managers not being content with the results of general diversification. In such cases the quality of management will always be a critical factor. The comparative success of Incorporated Investors in following this policy should be mentioned. Cash distributions on each share of its stock since 1926 showed an upward trend, even in 1931 cash distribution was 35 per cent larger than in the former year. In no year was the distribution less than in 1926.

Common Stocks as Investments.—The tendency of investment trusts to invest in common stocks raises the question of the profitability of these issues as investments. A number of books and no end of articles have been written presenting the favorable side of this problem but without conclusions that carry conviction to the reader. The matter is too complicated for detailed discussion in a general text on investment. Some things, however, seem to be plain. If bought from the long-run point of view, the result becomes very uncertain. Little can be known about individual stocks 10 to 20 years hence. Many of the blue chips of 20 years ago now repose in the graveyard of investment. Witness the many stocks of street railways, the New Haven Railroad, the Chicago

¹ *The Annalist*, Apr 15, 1932

and Northwestern, the Chicago, Milwaukee and Saint Paul, textile, leather, coal mining, and railroad equipment stocks, and others too numerous to mention. Who can say what will befall the blue chips of today 20 years hence? If common stocks for long-time investment are to turn out successfully, it will be on the basis of selective judgment rather than on the general principle of diversification. Selective judgment is likely to find most profitable results in rising industries, whose stocks will become the blue chips of tomorrow, rather than in the blue chips of today which may suffer the fate of similar stocks in the past.

Common stocks as investments offer great speculative reward from the cyclical point of view. Severe depressions of the past invariably have brought correspondingly great opportunities for profitable commitments. The Dow-Jones average prices of industrial stocks rose from a low of 42 in 1903 to a high of 103 in 1906. In 1907 they were again down to 53, only to be followed by a rise to 100 in 1909. In 1914 they were again down to 53 but in 1916 advanced to 110. The depression of 1921 saw these averages at 63.9, while the boom times of 1929 lifted them to 381. The recent depression again found them at 45 (June, 1932). No important group of stocks is able to escape these tidal swings in prices. It would seem that by far the best opportunity in common stocks lies in the cyclical upswings. Profits may here be quickly realized if the stocks are disposed of before the certain slump that follows. But it may be fairly questioned whether the trust with its unwieldy portfolio is in a position to take advantage of these swings in prices. Trusts with vast resources acting in concert are likely to depress prices in proportion as they attempt to realize profits. Here the investor of moderate means possesses the advantage.

Diversification.—The problem of financial policy raises the question of diversification in trust portfolios. Two purposes may be served by diversification. first, the risk may be lessened, second, the income may be increased. In point of logic, these are mutually exclusive, in practice, diversification attempts a compromise between the two purposes so that the risk is somewhat lessened and the income somewhat increased.

A third type of diversification is sometimes advocated, namely, lessening the risk due to changes in the purchasing power of money. This raises the question of relative advantage of stocks and bonds in the face of rising or falling commodity prices. That there is an element of diversification between stocks and bonds on this ground cannot be denied. The question arises, however, as to whether this type of diversification does not infringe too severely upon fundamental policy as to risk. A conservative policy which adheres to bond investments may be weakened through the acquisition of stocks, likewise, a speculative policy becomes more conservative as it seeks to diversify through the acquisition of bonds.

In seeking to apply a policy of diversification embracing the first two purposes, opportunity is offered through four fundamental types of risk. First may be mentioned the broadest type, the political risk. This type of risk arises because of political organization. The securities of a given country are profoundly affected by the economic, social, and political policies of the government. This form of diversification, therefore, would call for investment in the securities of a diversified list of countries.

The next type of risk is bound up with the different geographical sections of a given country. A country like the United States, for example, in its broad area presents widely different characteristics peculiar to the different geographical sections. Some sections are predominantly agricultural, some industrial, others commercial.

Entirely different in the nature of the risk involved are the different industries themselves, without reference to geography or political organization. Economic history is largely an account of the rise and perhaps the fall of different industries. Diversification with reference to different industries would secure the greatest opportunity of participating in the success of rising industries, always the most profitable.

Lastly, the idea of diversification may be narrowed down to particular companies in a given industry. It is seldom that the future winner in a given industry can be selected with certainty. Here management plays the most important part. Human life is too short to permit of any given personnel maintaining an outstanding position for an indefinite length of time. It is therefore difficult, if not impossible, to avoid great risk if securities are confined to only one company in a given industry.

Capitalization.—The capitalization of fixed trusts and of investment funds is simple, being in both cases composed merely of certificates of participation. These are of equal merit with those composing the portfolio, since no attempt is made to trade on thin equities. The benefits of diversification and combination place these stocks in a position where the losses on a few issues of securities owned are likely to be offset by the gains on others.

The capitalization of the general management type of trust is similar to holding companies in general. Combined capitalization of 146 trusts of this type in January, 1929, showed the following:

Securities	Capitalization	Per cent
Bonds and debentures	\$200,000,000	20.5
Preferred stock	439,000,000	45.0
Common stock	337,000,000	34.5

Some trusts which are otherwise conservatively operated show higher capitalization in bonds than the above would indicate. For instance,

the four subsidiaries of the American Founders group showed the following percentages at the beginning of 1929

	Per Cent
Debentures	40 to 50
Preferred stock	30 to 35
Common stock	15 to 25

The relatively high percentage of the capitalization represented by bonds renders it obligatory to invest funds in income-producing securities in sufficient amounts to insure the payment of interest on the bonds outstanding. Likewise if the preferred stocks of the trusts are high class, they must have back of them protection in income from interest and dividends that will remove reasonable doubt as to the ability of meeting dividends.

The bonds of investment trusts are generally debentures or collateral trust issues. The debentures quite generally require that the current value of total assets be, say, 200 per cent of the amount of debentures outstanding. Collateral trust bonds are based upon the same principle, except that deposit of collateral is required. In case the market value of assets falls below this stipulation, no dividends can be paid upon the stocks.

Stocks.—The preferred stocks of investment trusts are usually of the simple variety with preference as to dividends, and assets in liquidation. Their weakness lies in the fact that the underlying securities are composed largely of common stocks, and in times of depression both the income and market value of these issues have unfavorable records. The equities back of them largely vanished in the depression of 1930-1932.

The common stocks are at the top of the financial pyramid and are based upon a thin equity which vanishes at the first reversal of business. These are among the most speculative of all stocks on the market. Most of them have had their equities entirely wiped out during the current depression. Situated as they are at the top of the pyramid, their values crumble at a much more rapid rate than the decline in the securities of the portfolio.

Prices of Investment Trust Securities.—Both the bonds and stocks of investment trusts were overinflated in price during the boom days of 1929, just as they are now undervalued in comparison with their assets. These extremes are a reflection to a large extent of the high hopes and subsequent disappointments entertained concerning the ability of the managements. Most of these stocks sold at prices 20 to 40 per cent below their asset or liquidating value during 1930, 1931, and 1932. But this situation was little different from that which prevailed with respect to many of our best industrial corporations. Stocks of the latter frequently sold below net current asset value and occasionally below cash in the treasury of the corporation. Speculatively considered, stocks

of investment trusts are among the most promising in the upswing of the cycle, since they possess great "leverage" similar to those of holding companies in the electric light and power industry

Market for Trust Stocks.—Investment trust stocks were very popular in 1928 and 1929. They were sold widely over the entire United States. In 1930 and 1931 the certificates of fixed trusts also rose to great popularity. In almost every case that has come under observation, the number of stockholders of these concerns showed an increase at the end of 1931 over 1930. Today the stocks of both of these types of trusts are even more popular. There seems to be little doubt that the future market for investment trust securities is assured.

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CHAPTER XXX

REAL-ESTATE SECURITIES

Real-estate mortgages are the oldest of all modern investments. They were current in ancient Babylon in 2200 B C and contained even then the most essential features of the pledge—namely, maturity date, place of payment, and priority over all subsequent debts. One of these mortgages written on a clay tablet in 430 B C was unearthed in 1893 by an archeological expedition of the University of Pennsylvania. It was given to secure the payment of 30 bushels of dates and contains the following binding clause, "Their field, cultivated and uncultivated, their fief estate, is held as a pledge for the dates, namely, 30 bushels, by Bel Nadin Shun. Another creditor shall not have power over it." The last clause guarantees the instrument to be a first lien. From those ancient times, the real-estate mortgage has endured through all the vicissitudes of history, among all peoples of which we have a record, and is today pronounced by many the safest of all kinds of investments, governments and municipals included. As a class, real-estate mortgages and mortgage bonds are undoubtedly entitled to a position second to none.

The past 60 years of real-estate mortgages contain unpleasant features. The severe losses from city real-estate mortgages, following the panic of 1873, forced many insurance companies in New York, Chicago, and other cities into bankruptcy. Many private investors suffered the same fate. The unfortunate experiences of this time had their origin in too rapidly growing communities and the lack of proper methods and laws governing real estate—conditions which will never return in American history. More recently the appearance of newer classes of "real-estate" bonds and mortgages and their disastrous experiences in 1931 and 1932 tend to cast reflection upon the traditional type of real-estate mortgage. Detailed comment upon this situation will be made presently.

Site Values.—Urban land values are fundamentally different from farm values. Whereas farm values rest upon the capacity to produce commodities, urban values rest upon fundamental advantages of location, namely, site values. Of all the surface of the earth available for the building of cities, only small areas are selected for the concentration of population, industry, and trade. These points possess certain fundamental characteristics which make them especially valuable for centers of life.

In an agricultural country such as the United States has been through the greater part of its history, it has almost invariably been the commercial advantages of certain points that have decided locations. As the country developed industrially, advantages for manufacturing and mining have been of great influence in determining location and growth. Cities grow in size in proportion as they possess advantages for these purposes. The greatest American cities possess fundamental transportation and trade advantages. New York has its harbor, its inland water and rail connections, and proximity to rich agricultural districts—a combination superior to that of any other city of the country. San Francisco and New Orleans are famed for the advantages of their ports. Chicago has its lake trade but, more important than that, it is the center of agricultural America and the converging point of most of the leading trunk railroad lines of the country. As industrial centers, Pittsburgh and Birmingham illustrate the advantages of accessibility to transportation facilities and mines. Butte hangs by its copper mines. As one passes to the smaller cities and towns of the country, it is found that important highways or country roads and particularly intersections determine location. The extent and permanence of these advantages determine the growth of population centers and ultimately of land values.

Within the city there is in a sense a repetition of the fundamental causes of location of the city itself, in that the business district seeks the point of greatest advantage with reference to transportation. It will be close to the railroad station, the wharf, or landing, or at the intersection of highways. These tend to persist as the city grows in size. The residence district will develop on the fringe of the business district and, as the latter encroaches on it, it will seek more outlying points. These will disperse farther and farther in proportion as transportation facilities improve. Recently the automobile has accelerated the movement of population to suburban districts and caused a shifting of land values.

Within the two main divisions of urban land, certain subdistricts develop, each seeking the point of greatest advantage to itself. There will be the financial district, the retail district, the factory district, and so forth. Still more minute subdivisions will be discernible such as the furniture district, the automobile district, the retail dry-goods district. The business of greatest importance for the city will occupy the most valuable sites. Sometimes it is the financial district, as in New York, but most generally it will be found that the retail trade gravitates to the most valuable locations. Each city must be judged in the light of its own peculiarities.

Principles of Valuation.—The value of improved city real estate, including both land and building, is determined upon the basis of the average annual net rental. The net rental is arrived at by deducting from the gross rental of the land and building, expenses for operation,

repairs, maintenance, taxes, and depreciation of the building. The net rental capitalized at a suitable rate, depending on the character of the property and the condition of the money market, will give the value of the property.

Gross rental varies from time to time, while some buildings are operated with better results than others; a conservative average, after taking all the factors applicable to a particular problem into consideration, should be taken as a basis. The average rental on any class of property also varies with the stability and permanence of its usefulness, this is greatest in property located in the financial or retail districts and least in tenement or suburban districts. In the former instances a low rate, and in the latter a high rate, would be proper for capitalization purposes. While principles are simple enough, only the practical real-estate appraiser or dealer can apply them with correct results.

The second step in city real-estate valuation is the separate valuation of land and building. It is first necessary to determine whether the existing building is of the type which is best suited to the location and which will consequently return the greatest annual rental. The maximum utilization of site is the ideal and the starting point for sound valuation. If the building does not measure up to this on account of its age, obsolescence, or ill-adaptation to the site, part of its cost value will have to be written off. If it is adapted to the site, its value is determined by either the cost of construction or the cost of reproduction at the time of calculation. The cost of construction will measure the true value as long as costs have not permanently changed since the time of construction; the cost of reproduction should be used in case of permanent changes in construction costs. The fluctuations due to temporary changes in business conditions should receive at the most only minor consideration.

If the original cost of construction is not known or if costs have changed, it is customary to compute the value of the building on the basis of its cubical contents or the number of square feet of floor space, the unit-cost factor varying with the type of building and current prices of materials and labor. Unit costs are lowest in case of non-fireproof loft buildings, common brick flats, and steam-heated, non-fireproof apartments, and highest in case of office buildings and hotels. Any figures which may be given are likely to be worse than meaningless to the novice, moreover, they must be determined with reference to the location of the city in mind. Another method of calculation is based upon gross rentals. Values calculated in this way range from seven or eight to twenty-five times the gross, in the case of dwellings and flats, to four times the gross in case of office buildings. The entire matter is too indefinite for present purposes.

If the existing building fails to utilize the location for the maximum service and so falls short of the maximum amount of rent obtainable, its

value can be determined only by first calculating the value of the land and then deducting this amount from the total value of the property as obtained by the capitalization of the annual net rental as just explained. As an illustration, assume that the land is not fully utilized by the existing building but that its value if fully utilized by the proper type of building would double. If the capitalized rental had previously resulted in a combined valuation of, say, \$50,000, the original value of the land having been \$15,000 and the building \$35,000, doubling of the land value would give \$30,000 and leave only \$20,000 for the building. If the land continued to increase in value, based upon the highest degree of utilization possible, until it reached \$50,000, the original valuation of both land and building, the value of the building is said then to have merged in the value of the land. The property has then reached a stage where to retain the valueless building would result in a loss in income, should the land rise further in value. In New York City, it is usually assumed that the value of the building is merged in that of the land after 50 years have elapsed. But even before this stage is reached, it generally happens that the old building, although in good physical condition, is razed and one better adapted to the location is erected.

Valuation Systems.—Based upon these general principles, arbitrary valuation schemes have been worked out which enable one to calculate mechanically the approximate value of land utilized below its maximum capacity and, also, of vacant lots which bring no income to their owners. In the case of the latter, it is the potential rent, if used to the maximum availability, that is the underlying basis of value. Having given the value of representative land in the same location or block, which is arrived at by capitalizing the net rentals and deducting the cost of the building less depreciation, the value of the lot under consideration is gauged with reference to the lot of known value. The standard-size business lot in the largest cities is commonly 25 by 100 feet, while in cities of less population it is likely to be larger in both dimensions. Whatever the dimensions for a particular city may be, some standard size is chosen as the base which is valued on the basis of each foot of street frontage. In order to estimate the value of lots of lesser or greater depth than the standard size, a number of methods have been devised. In New York, the Hoffman rule is most used in the valuation of short lots. The standard lot is divided crosswise into 5-foot strips for its entire length, and arbitrary values are assigned to each strip. The front strip, being the most valuable, is assigned 16 per cent of the total, the last strip, only 2 per cent; and the intermediate strips, varying percentages. The Davies rule is more detailed, assigning a value to each 1-foot cross-strip and providing for lots with depth of 200 feet.

The value of lots other than the standard size is affected according to width and shape. Some of lesser width than the standard size may be

valued in the same ratio per front foot, while some located in other districts may be entirely unsuitable for building purposes if narrower than the standard lot. Circumstances may make necessary the assignment of a larger value per foot of street frontage where the width exceeds the standard. Each case has to be decided with reference to the individual circumstances. Lots with diagonal boundaries are usually valued according to the average depth or width. Corner lots are frequently valued at 50 per cent higher than inside lots. This, however, will depend upon the importance of the intersecting streets. Corner lots admit of better air and light and have the advantage of the extra street frontage. The lot next to the corner is usually considered to have 10 per cent greater value than inside lots ¹

Sale Prices—The foregoing principles may be said to be those of true land valuation. On the other hand, the sale prices of lots have sometimes been taken as true values. Values arrived at in this way must represent the price paid by the purchaser who is under no compulsion to buy and accepted voluntarily by the seller who is under no compulsion to sell. Actual sale prices, however, while frequently affording a good measure of value, are often influenced by prospective values. This is particularly true in cities or towns which are growing rapidly, when prices are almost invariably forced far beyond the true value of the land. The corrective of such overvaluations comes during business depressions. Likewise, prices of land sold at auction, following foreclosure of mortgage, are likely not to represent true values. The exact result cannot be predicted except with reference to the individual community. Customs differ. In some instances as much as 25 per cent is habitually deducted from the true value at forced sales, while in other places 10 per cent is considered correct. Voluntary auction sales, however, such as regularly found in New Orleans, and spasmodically in numerous other communities, may be as good an index to the true value as in the case of private sale.

It is well to remember, also, that lots higher than the street are usually worth less than lots at grade, since the cost of reducing the elevation is a dead loss. Lots lower than the street level will also have to be discounted on account of the expense of filling. Sites, especially for dwellings, may have their usefulness much impaired through proximity to nuisances, such as unusual noises, unsightly structures, and malodorous fumes or gases from manufacturing plants. Absence of ordinary public-utility services, such as gas, light, and water, will also detract much from the value of lots. Prices are influenced profoundly by the direction of the growth of the city. Lots located in the path of growth take on prospective values years in advance, while lots located away from the direction of growth are likely to go at bargains. It has been claimed by some that,

¹ On the subject of real-estate valuation, see P. A. Benson and N. L. North, *Real Estate, Principles and Practices*, Chap. xiv.

other things being equal, the prevailing winds determine the direction of growth. The direction of the prevailing winds leads away from the smoke and dirt of the city. The topography of the surrounding country probably has more to do with the direction of the growth of the residence section. Elevation, view, sunshine, and fresh air are greatly prized in the better residence sections.

Growth of Values.—The steady growth of realty values in cities is a familiar fact to all. It is especially pronounced in the United States, since the country is comparatively new and the population is finding its equilibrium between country and town on the one hand, and the city on the other. Census figures for 1930 show a continuation of the tendency of population to shift from the country to urban districts. In 1910, approximately two-thirds of the people lived in cities, while in 1930 more than three-fourths of the population lived in urban communities. This, together with the sheer growth of the country's population which has more than trebled since the Civil War, accounts for increased urban real-estate values in the United States.

Whatever the future course of land values in general may be, it would be a great mistake to assume that the value of all land, wherever located, will move in the same direction. Changes in the internal structure of cities cause land values to fluctuate in unpredictable directions. Business sections often move in response to changes in the transportation system, of which the building of the subway system in New York City is the most conspicuous example. Improved transportation by electric railways and automobiles in the past two decades has completely altered the residence districts of many cities and is responsible for the rapid growth of the suburban districts. The change in residence districts has been followed by corresponding changes in retail districts. Wholesale districts adhere closely to the railroad facilities, while financial districts follow business sections. Changes of this nature are often unpredictable for any length of time and cause great losses to some real-estate owners, while they result in corresponding gains to others more fortunately located. Frequently, natural circumstances fix the business or financial district permanently at a certain point. The financial, shipping, import, and export districts of New York City appear firmly anchored at their present site on account of the proximity to harbor facilities. Thus, while permanence is the chief characteristic of land values in general, it cannot be attributed indiscriminately to all land.

The permanence and stability of land values also vary greatly within a community in accordance with the principle of specialization already discussed. Land located in the retail business district shows, perhaps, the greatest permanence in value on account of its adaptability to many different purposes. Retail establishments, wholesale concerns, financial institutions, and office accommodations all compete for land favorably

located. On the other hand, land used for residence purposes is more specialized, serving mainly for the one purpose. Suburban districts are likely to be very unstable in value and, when boomed far beyond their real values, periods of depression bring a rude awakening to the owners. Manufacturing districts are least likely to increase in value unless there is an element of monopoly in their location. Such is the case where factories are located at water-power sites or in a narrowly restricted railroad district. But land for factory purposes is usually highly specialized and its future, therefore, very uncertain.

The greatest adverse changes in city real-estate values are likely to come in periods of depression. Realty values lag somewhat behind the general movement of business. On top of a wave of prosperity expiring leases are renewed upon favorable terms to their owners, which require time to be reflected in the sale price of the land. On the other hand, rentals previously contracted persist during periods of depression in the face of renewals of leases at lower figures. The general halt in building construction that accompanies a period of depression damps interest in real estate. Outlying residence sections are likely to suffer materially in value at such times. Office buildings suffer more than business establishments because of the tendency to multiply offices during periods of prosperity which soon vanish when business enters the period of depression. Business concerns are not likely to discontinue operations at such times.

Income as an Element of Credit.—The traditional real-estate mortgage is the short-term instrument, the maturity seldom exceeding 5 years. The proceeds of the issue were generally invested in the property itself. Payment at maturity was very uncertain, since the period of the loan was usually too short to accumulate sufficient income from the property for its payment and the owner had to depend upon other sources for funds to meet the obligation. Failure to provide the necessary funds led the borrower to seek a renewal of the loan. If these efforts failed, default and surrender of the property to the mortgagee were the inevitable results. Thus the value of the property itself was the main dependence of the lender for the satisfaction of the obligation. Recent real-estate financing has lengthened the period of the loan to 10 or 15 years, with provisions for serial or sinking-fund payments calculated to satisfy the entire loan within the stipulated period. Moreover real-estate projects have greatly increased in size, making it necessary to raise needed money through public subscription the same as in corporate financing. To a certain extent this has brought city real-estate financing into the general range of corporate principles. This is true in so far as the provisions for the payment of the interest and principal now depend upon the earnings of the property itself. Outside sources of income are generally unavailable, since the property is usually owned

by a corporate organization. Yet great significance must still attach to the value of the property itself as security. In contrast with fixed industrial assets, real estate is of the non-specialized type and capable of many different uses so that, if income fails, the value of the property itself will not be greatly affected. Nevertheless, the increased emphasis upon the earnings of the property combined with the longer term of credit increases the emphasis to be placed upon this element in credit appraisal.

Rentals.—While there are certain incidental revenues coming to the real-estate concern, they are generally of minor importance and may be neglected here. The source of dependence in financing is the revenues paid by tenants of the property. Rentals for business offices, shops off the street level, wholesale spaces, warehouses, and all instances where display is of minor importance are calculated on the basis of square feet of floor space. Retail space is commonly figured on the front-foot basis. Apartment rentals generally are based upon the number of rooms rented.

In estimating rentals of real estate, a long-term range is usually taken as the basis, with an effort to establish the general trend applicable to the given class of property. A level rental basis is then adopted for the period in conformity with the average trend of rentals. This avoids undesirable fluctuations in rentals due to temporary conditions. The trend will usually coincide to some extent with trends in commodity prices.

The trend line on business property will be determined by the rate of growth of the city in the first instance. It will be profoundly affected by the trend in commodity prices. If this is upward it will accelerate the normal trend line, but if it is moving downward it will tend to offset the increase from growth.

Rentals determined in this way must be adjusted in certain cases to the age of the building. This is particularly true with light manufacturing buildings and lofts. It appears to be greatest in apartment buildings, owing both to structural depreciation and to obsolescence of appointments. A noticeable degree of decline is found also in professional office buildings requiring certain up-to-date equipment, as medical and dental offices. Only small allowance is necessary in the case of retail stores, hotels, and old office buildings located in the financial districts.

Figures arrived at in this way are based upon full occupancy. Allowance must be made for average vacancies, as experience with the class of property in the given locality would dictate. Vacancies in down-town stores is at the minimum, seldom ranging above 1 or 2 per cent or above 4 or 5 per cent in suburban districts. For office buildings the average is somewhere around 5 per cent and for apartments and light manufacturing buildings and lofts it may be as high as 10 per cent.¹

Real estate is characterized by comparatively small expenses of operation. Expenses of operation are highest in office buildings and

¹ LEE BARCOCK, *The Appraisal of Real Estate*, p. 137

lowest in residence property. Office buildings require in some instances 50 per cent of gross receipts for operation, the ordinary store building, something like 15 per cent, residence and apartment buildings often run as low as 5 per cent. Where the cost of operating a building is high, a comparatively small drop in gross, resulting from failure to keep the building occupied or from reduction of rents for any cause, will materially reduce the net earnings. In office buildings, a 30 per cent drop in the gross may mean a 60 per cent drop in net, while the percentage of decrease in a store building would result in something like 35 per cent decrease in net. Office buildings tend to vary more in gross with the accompanying wider fluctuations in net than store buildings, for the reason that when a business boom comes thousands of new concerns start up, all demanding office space. At such times the office accommodations in cities are strained to the limit, during the inevitable period of depression following, these same offices are abandoned and many others besides, bringing in greatly decreased gross and still slenderer net earnings.

Stores are generally rented for longer periods and business concerns maintain their leases through all kinds of business conditions. It, therefore, becomes of the greatest importance to know the character of the tenants and the business in which they are engaged. Compare, for instance, the permanency in the occupancy of an office building by a railroad or insurance company with the evaporation of the blue-sky occupant when "business" fails. The management is charged with considerable responsibility in the character of the tenants secured. In general, it may be said that income from real estate used for wholesale, retail, or financial purposes is relatively stable in character, that secured from property utilized for factories, suburban residence, and special kinds of business is relatively fluctuating in character. Rents which show a decided tendency to wide fluctuations in net are not so suitable for mortgage loans as those with steady income.

Residence Property.—The tendency toward fluctuation in residence property is more pronounced than in most business property. This is specially true where there is a surplus of property for homes. Under such conditions, property is likely to remain unoccupied for long periods of time. While there has been a shortage of residence and apartment property in recent years, it appears that this condition has in most places already been relieved, at any rate the time will come, sooner or later, when there will be an actual surplus of accommodations as was the case in pre-war days. This is likely to be accompanied by reduced rents and unoccupied property.

The income from residence property does not originate with the property itself. Whether occupied by the owner or tenant, the property is, nevertheless, the home of the occupant and therefore unproductive. Payments of interest and principal on mortgages on houses must be

derived from other sources. The occupation or source of income of the tenant thus becomes of significance. Is his occupation permanent? Is he prosperous in business? Has he a reputation for honesty in the meeting of his financial obligations? These and many other questions intended to reveal the amount and character of the income of the occupant become important.

Unoccupied Property.—The case of unoccupied property needs special mention because there is never any income attributable to the property itself. While mortgages on this class of property are rare, or unpopular to say the least, they may in some instances be written if a sure source of income is discoverable and definitely made applicable to the mortgage, which, however, would be a rare instance. In practice, mortgages on such property are eschewed. Vacant lots have only a potential income, estimated at the amount obtainable in case of utilization to the best advantage with reference to the district in which it is located. While this furnishes no sound basis for mortgage loans, it, nevertheless, has significance for the subject of valuation.

In calculating net income from real estate, taxes and special assessments must have consideration. Special assessments may be for paving, sewer connection, water mains, and in some instances for sprinkling of the streets. While the payments for most of these operate to increase rent and eventually add to the value of the property, nevertheless they must be currently met out of the gross receipts from the property and so lessen the amount available for interest on the mortgage loan. Regular property taxes are a true deduction from gross income, their amount never adding to the value of the property.

The Mortgage.—At common law a mortgage created, by means of conveyance, an absolute estate, although it was intended only to guarantee the performance of some act, usually the payment of a debt. It gave the right of possession of the property to the mortgagee from the time of its execution in order to secure the repayment of the loan. The title, nevertheless, was conditioned on the non-payment of the debt, and consequently upon the payment of that debt the title reverted back to the debtor. The common-law doctrine was modified in the English courts of chancery to the extent that the debtor had the right to redeem his debt after its maturity, and moreover he was entitled to what remained after the amount of the debt was satisfied. These rights became known as the "equity of redemption." In the equity courts the debt became the principal part of the contract, while the mortgage was only an accessory, and this is the present status of the law in most of the states of the United States. From this point of view "a mortgage is considered a mere lien or security for a debt, passing no title or estate to the mortgagee, and giving him no right or claim to possession of the property."¹ In Louisiana

¹ WILLIAM LILLY, *Individual and Corporation Mortgages*, p. 6

and Illinois, the common-law doctrine still prevails, but only as a guarantee for the protection of the mortgagee's interest

A mortgage is an indenture. Formerly two copies of the agreement were made upon the same sheet and signed by both parties, whereupon the two parts were severed by a notched or waving line which afterwards served to identify their genuineness. At the present time, however, mortgage indentures are signed only by the mortgagor, whereupon the instrument is recorded by a public officer, usually the register of deeds, where the property is located. Failure to record the mortgage in no way invalidates the contract in the equity courts. If the mortgage is unrecorded, however, the mortgagee remains unprotected against the establishment of a prior lien on the property, as in the case of a second mortgage which may be recorded regardless of the date of the execution of the second mortgage. Furthermore, if the mortgage is unrecorded, the sale of the mortgaged property to a third party who is innocent of the mortgage lien creates a prior lien to the extent of the consideration of the sale in favor of the third party. It is, therefore, of the highest importance that the mortgage should be recorded by the lender in order to protect his equity. Mortgages covering land in different court jurisdictions must be recorded with the proper officer of each jurisdiction.

While a mortgage is simply an agreement creating a lien in favor of a creditor, most mortgages contain additional clauses or covenants looking to the better protection of the lender. The most common of these covenants are as follows. The mortgagor agrees to pay principal and interest as they come due, to permit the mortgagee to sell the property in question in case of default on payments of either the interest or principal when due, to pay all taxes and assessments due on the property, and to keep the buildings on the mortgaged property in good repair and insured. The mortgagor, moreover, guarantees that he has a good title to the property. The defeasance clause guarantees that upon the satisfaction of the debt the property will revert to the mortgagor. The defeasance clause may be a separate document, and in that event it should be recorded along with the mortgage.

While a real-estate mortgage constitutes a lien upon property, it is not the only lien that may exist. Any legal claim on property for a debt or charge constitutes a lien as understood in law. In most states, the legislature has declared that taxes assessed against property and remaining unpaid are a lien upon the property. So, also, a judgment for money against the owner of a piece of land when docketed upon the judgment roll of the county clerk becomes a lien on all land within the county owned by the defendant. No matter how the lien arises, such a claim remains attached to the land until settled, regardless of changes in ownership.

In order to avoid confusion and litigation, the amount of the debt should always be stated in the mortgage, although this is not legally

necessary The lien created by the mortgage extends to the full amount of the money in the consideration that gave rise to it, plus any accrued interest remaining unpaid. Beyond this, no extensions of the amount are possible

Where there exists the possibility of several liens against the same piece of property, the matter of priority becomes important In the case of taxes, the statutes of most states give them priority over all other liens, this is true regardless of whether they were assessed before or after the mortgage was executed Real estate can be sold by tax authorities at any time when it becomes necessary to satisfy tax claims, no matter who the owner at the time happens to be Judgment liens, however, constitute a claim prior to the mortgage claim only if recorded before the mortgage was executed. The order, then, of the distribution of the proceeds of a sale to satisfy liens would be as follows all tax claims together with the expenses necessary in making the sale would come first, judgments secured and recorded prior to the execution of the mortgage, second, mortgage claims, third, and the remaining proceeds, if any, again become the property of the owner of the land at the time the sale was made

Transfers.—Mortgages may be transferred through sale by the mortgagee or otherwise to any one legally competent to make a contract This may be done without the knowledge or consent of the mortgagor

Where the maturity date is given in the mortgage—and this is almost universally the case—the mortgagee cannot collect the debt until the designated time elapses. The privilege of transferring the mortgage to a third party is, therefore, highly desirable to the investor who may have occasion to employ his funds in other ways before the maturity date Transfer of the mortgage, however, does not pass legal title to the land itself but only to the mortgage In some states mere assignment of the mortgage is all that is necessary in order to transfer it to a third party, while in others all of the formalities of the original execution of the mortgage are necessary Ordinarily the mortgagee in selling the mortgage by assignment is relieved of any responsibility for the payment of the debt in case the mortgagor fails to perform his part of the agreement But if the mortgagee guarantees to the purchaser prompt payment of interest and principal, he may be held responsible If the mortgage is supplemented by a note and this is endorsed by the mortgagee, the case is then the same as with any other negotiable instrument where the endorser renders himself liable.

In case the mortgagor desires to sell his property and the prospective purchaser prefers the property unencumbered, the only practical way by which this can be accomplished is to persuade the mortgagee to accept settlement for the principal and accrued interest before the maturity date The mortgagor may sell his equity of redemption in the property

without the knowledge of the mortgagee, or he may create a second mortgage on the basis of his equity of redemption and still possess the equity, subject, however, to both the first and the second mortgage. Upon sale, however, all equity of redemption passes to the third party. The new owner then holds the same relation to the first mortgage holder as the original mortgagor. Upon a sale of the equity of redemption, the mortgagor is relieved of all responsibility in connection with the debt which has been assumed by the new owner. Any personal covenants, however, which the mortgagor might have made in favor of the mortgagee or the new owner would still have to be performed. These may extend even to a guarantee of the payment of the entire debt which then remains a valid liability until the mortgagee gives a release from the obligation according to agreement between the parties concerned. If the new purchaser does not assume the mortgage, he is in no way personally liable for the debt, although the mortgage still attaches to the property in question. In some states the mortgagor can in no wise relieve himself of the obligation of the debt, even though the mortgage is assumed by the new purchaser. The mortgagee then has a claim upon both the former and present owner of the property.

Default and Foreclosure.—Ordinarily a mortgage debt becomes due on the date of maturity known as the "law day." A mortgage usually provides covenants, the non-performance of which after the lapse of a specified number of days, usually 30 to 90, automatically matures the principal. The non-performance of these covenants is known as a "default." Mortgage agreements usually provide that failure to maintain insurance on the property is default. Sometimes, also, the mortgagor covenants to avoid waste and any action which would lead to the deterioration in value of the property.

The principal of a mortgage debt, then, comes due at the maturity date or upon failure to perform the specified covenants. If the party liable for the principal refuses payment or is unable to satisfy the claim, several courses may be pursued, depending upon the statutes of the various states. According to the method of settlement by strict foreclosure, the mortgagee appears before the proper officer of the court and asks that a definite date be set after the law day, after which, if the debt still remains unpaid, the title will pass absolutely to the mortgagee. This method of foreclosure, however, does not do justice to the mortgagor, for the value of the property may be, and usually is, greater than the mortgage indebtedness. The method of informal foreclosure is generally found in practice at the present time. By this method the mortgagee files a bill of equity setting forth the circumstances and asking for settlement of the debt. After complying with all of the formalities required by law, the court has the property appraised and an "upset" price is fixed as the lowest amount for which the court will allow the property to be sold.

Neither the mortgagor nor anyone else who has an obligation to discharge the debt is permitted to purchase the property at a foreclosure sale.

The proceeds of the sale are distributed in the order of the priority of the lien as indicated above. In case those interested in the property would be injured through the failure of its operation or upkeep, or for any other reason, the mortgagee or anyone who has an interest in the mortgaged property may have a receiver appointed. His duty would be to collect all revenues arising from the operation of the property, to manage it himself during the interval, and properly to protect it from deterioration. If this requires the expenditure of more money than is available, the court will authorize that new funds be raised through the sale of receiver's certificates, which then become a lien upon the property prior to the mortgage lien itself and all other liens except the expenses of the foreclosure sale and taxes.

In some states the mortgage may contain a power of sale by foreclosure which would entitle the mortgagee to sell the property without applying to the court, upon the default of the mortgagor to perform his covenants. The equity remaining, after the debt is satisfied and all other expenses are paid, would revert to the one entitled to the equity of redemption. Whatever method of sale is used, if the proceeds realized from the sale of the mortgaged property are insufficient to satisfy the debt, most states allow a deficiency judgment against all of those who have any liability in connection with it. It is also true that in most states, even after foreclosure sale, the owner of the equity of redemption has the right to redeem the property within a specified time, in some states as long as 2 years, by reimbursing the purchaser for the amount paid for it. The mortgagor may thus regain full possession of his property. This right, however, may be waived by the mortgagor.

Second Mortgages.—Second mortgages are junior in lien to first mortgages and hence are weaker issues. They are in the nature of temporary or personal loans, while first mortgages are more or less permanent in character. The principal is frequently paid out of income, while first mortgages are regarded as capital funds. On account of their inferior position, second mortgages are especially protected. They usually provide that the holders may pay money due on the prior lien, adding the amount paid of the second mortgage, in order to avoid foreclosure which would eliminate the equity back of the second mortgage. Nevertheless, the total cost of second, and other junior, mortgages to the borrower is great. The interest rate will probably be about 7 per cent, while the expenses of writing distributed over the short period of time plus a discount of 5 per cent, or more, will add sufficient amount to costs to bring the total up to 12 or even 20 per cent per year.¹

¹ E. M. FISHER, *Advanced Principles of Real Estate Practice*, p. 182.

The Mortgage Bond.—The most advanced stage of development in real-estate mortgage loans is collateral trust real-estate bonds. These are issued by mortgage companies or banks for which they become direct obligations; they are divided into convenient denominations and sold to the general public in whatever amounts desired. They are issued in large blocks of definite amount and secured by the deposit with a trustee under a trust agreement, the same as in the case of the corporate mortgage, of a sufficient number and amount of mortgages to cover the entire block. The deposited mortgages are the real security of the bonds and, in case of withdrawal of any of the pledged mortgages, substitutes in equal amount must be deposited. This enables bonds to be issued for a longer period than the mortgages, thereby permitting the borrower to pay off his loan at his convenience before maturity date. The trust agreement carefully stipulates in most cases the specific conditions to which mortgages deposited as collateral must conform. The bondholder is thereby assured of protection till the maturity of the bond. The participation certificate differs from the bond in that it is issued in any amount to suit the needs of the investor, while the bond is issued for specified amounts, after the fashion of corporate bonds, and each bond signed and certified by the trustee.

The Guaranteed Mortgage.—Bonds guaranteed by the issuing house or by an independent surety company have recently made their appearance in large volume. This arrangement places the assets of the mortgage or surety company back of the bonds. The cost of the guarantee is quite generally one-half of 1 per cent of the principal per annum and the yield to the investor is reduced in proportion. The guarantee is doubtless an added security especially in normal times. But when times are abnormal, such as they were in 1931 and 1932, the resources of the guaranteeing companies are insufficient to cover the losses.

The Collateral Bond.—This type of issue is used in financing real-estate developments and consists in depositing with a trustee the collateral securities, against which bonds are issued. As fast as the principal of the underlying securities is paid off, the bonds are canceled. Collateral bonds are liable to abuse if the borrower is permitted to substitute collateral of inferior quality. The trustee should be given the power of discretion against this abuse.

Land Trust Certificates.—Land trust certificates are rather new in real-estate finance. Their issue involves passing title to the property to a trustee who, in turn, issues certificates of ownership and grants a long-term lease to the former owner which provides for payment of interest and a sinking fund for the principal, according to the details set forth in the trust deed. The certificates may then be sold to the public as investments. This arrangement provides also that the former owner may repurchase the certificates, whereupon he again becomes the legal

owner of the property. It has been used chiefly on properties well located and of high value. But its use is confined largely to the state of Ohio.

Stock and Bond Issues.—The most recent forms of real-estate financing are by stock and bond issues. Real estate is passing largely to the corporate form of ownership. This enables the corporation to issue stocks and bonds the same as any other corporation. This form is especially adapted to large enterprises which require a wide distribution of their securities to the public. These enterprises have to do mostly with office buildings, hotels, apartment houses, and theaters and scarcely deserve the name of real-estate concerns. Their securities resemble more those of industrial corporations and their analysis should follow along these lines rather than those of the traditional real-estate mortgage.

Recent Experience.—The severe depression of 1930-1932 brought unparalleled distress to real-estate mortgages of certain types. The Investment Bankers Association estimated at the beginning of 1932 that, of the \$6,000,000,000 of real-estate mortgages outstanding, about 60 per cent of the property was "more or less in distress." Properties have been sold for as little as 10 cents on the dollar. The mortgages themselves were selling quite generally at 25 cents or less on the dollar. The mortgages in question rest on hotels, apartments, office buildings, and theaters, which are of the character of industrial enterprises rather than true real estate. These mortgages frequently had only 20 per cent, or nothing at all, as a margin of protection in property values at the time of issue, values being largely prospective in nature and based upon contemplated rentals. The interest and principal payment on serial issues simply could not be met out of the income from the enterprises.

This experience, however, should not be confused with that of the traditional real-estate mortgage on residence or other stable property. In these cases the experience of insurance companies which have large loans of this kind is reassuring. In some cases in 1931 property owned through foreclosure was less than 1 per cent of total mortgages owned.¹

Market for Real-estate Securities.—The market for the traditional real-estate mortgage is largely with savings banks, building associations, and insurance companies. These organizations have their investments regulated by law to a large extent and must in any case abide by high standards. Consequently, the newer types of securities must find a market among private investors. In order to facilitate the exchange of the larger issues, the New York Real Estate Securities Exchange was recently organized with actual membership of 250 and authorized membership of 500. Securities on properties in any part of the United States may be listed. Income statements and balance sheets are required of those listing securities, the former for at least 5 years back, if available.

¹ *Barron's*, Mar 7, 1932

This organization undoubtedly will create greater marketability for the securities of this type

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CHAPTER XXXI

FARM MORTGAGES

Development of Farm-mortgage Business.—The development of the western and southern farm-mortgage business began before the Civil War when a number of eastern men went west to engage in the business Benjamin Lombard, who went from Massachusetts to Illinois in 1840, began to sell farm mortgages to his acquaintances back in the home state as early as 1845 In 1851 Austin Corbin, who later built the Long Island Railroad, went from New Hampshire to Iowa with the intention of practicing law but soon entered the farm-mortgage business His operations covered several other states, including Mississippi Money was obtained from the East and loaned to pioneer farmers located along newly built railways The Quaker farmers of Pennsylvania were also lending money in this way through agencies established for the purpose In 1865 Daniel K Pearson established a sound farm-mortgage business in Chicago which was the beginning of the Pearson-Taft Company—the oldest active concern engaged exclusively in the farm-mortgage business

Men who afterwards became prominent in financial circles were interested in the farm-mortgage business in the eighteen hundred seventies, among whom was J B McKinley, a cousin of President McKinley Henry Villard, who afterwards became famous as a railroad builder, led a movement to establish a farm-mortgage system similar to those of Europe with which he was well acquainted J Pierpont Morgan, founder of the United States Mortgage Company, and many others became interested in long-time farm credits but, owing to the defective laws of western states, abandoned their projects Large amounts of money came from the East to the West through these farm-mortgage companies The interest rate was usually 10 per cent, and in some places 12 per cent, with an additional 10 per cent for commission.

In the eighteen eighties the western mortgage business developed into a national craze. This phase of the movement was fathered by James K Lombard, who with his cousin Benjamin K. Lombard formed the Lombard Investment Company, of Creston, Iowa, which was soon moved to Kansas City, Mo, where many other promotions originated James Lombard was a specialist in farm financing and town booming His activities extended to 18 western states and he sold securities all over the East as well as in European countries Stocks in these companies, debenture bonds (later called "jaybirds" from their color), guaranteed and unguaranteed mortgages on farms, blanket liens on town sites, mining

stocks, and railroad and irrigation securities were all sold by these companies "The laws themselves were a temptation, because generally they require neither paid-in capital stock, reserves, nor supervision, and the field was overrun by as bad a lot of financial freebooters as ever preyed upon the public"¹ The majority of lenders were widows, orphans, school teachers, eastern farmers, churches, and eleemosynary institutions. In all, something like \$800,000,000 was loaned in the 7 years preceding the panic of 1893

In September, 1893, the Lombard Company failed and dragged down with it all but a few of the companies which had grown to the thousands Defaults were numerous and many disappointed lenders sold at foreclosure, losing a large part of their money Those who bought the land and kept it through the financial storm of the early nineties were amply repaid in the rapid rise in the price of the land a few years later Although there was a lack of honesty in many cases, the chief defects of mortgage writing were overconfidence, bad judgment, faulty business methods, and the absence of adequate laws. Long-term mortgages with responsible companies back of them would have prevented the losses of this period.

With the revival of agriculture in the late nineties, following the disastrous experiences of the panic of 1893, the industry entered a period of almost uninterrupted progress until the period following the World War During these two decades farm mortgages had an enviable record as investments But post-war conditions have been unfavorable to agriculture, for over a decade agriculture has failed to participate in the general prosperity and the status of farm mortgages as investments has suffered severely

Income from Farm Property.—In discussing the income from farm property, the farm must be considered as a single operating unit. First, it must be remembered that land must have proper rotation of crops, otherwise its fertility will become depleted. The well-balanced farm will always have a portion of the land (not always the same fields, however) employed for pasture Farms in many parts of the central states have woodlands which serve for permanent pasture, while supplying shade and water for stock, woodlands also furnish timber for buildings, fences, and firewood, thus adding materially to the productive capacity of the farm. In many other instances, so-called "waste land" also serves as pasture and often supplies water and shade for stock Lastly, a portion of the land must be permanently employed for the home, garden, poultry, and barns and other buildings. It would, therefore, be a mistake to consider farm land from any other point of view than that of the single operating unit.

Perhaps the chief element in all farm values is the fertility of the soil Soil is fertile in proportion as it contains the four chief elements which

¹ See HERRICK and INGALLS, *How to Finance the Farmer*, Chap. II.

sustain plant life potash, phosphoric acid, nitrogen, and lime When these are contained in the soil in its natural state and preserved by proper cultivation and rotation of crops, fertility is relatively permanent in character, but where they have been supplied through fertilizers they must be renewed at least once in 5 years Soil should be porous so as to absorb extra water, retaining just enough for the crops through the growing season Climatic conditions are often a vital factor affecting the crops The season must be long enough for crops to mature without excessive danger of killing frosts In some instances, elevation is important, since some crops fail to mature at elevations of 1,500 feet or more above the sea level The rainfall is equally important Vast stretches of the arid West have a wonderfully fertile soil but lack the necessary moisture When this is supplied by irrigation, luxurious crops are produced The topography of the land is also important for proper drainage Expensive drainage systems are frequently supplied which transform land with an excess of moisture into high-grade farms County or district ditches are often constructed at expense to the owners, while tile drainage is often necessary Where this type of improvement is necessary, the value of the land in its original state must be discounted to the extent of the cost of the prospective improvements. When the soil has been brought to its highest stage of productivity, the value of the land will always have a definite relation to that of other farms in the vicinity, depending upon the fertility of the soil

The influence of the fertility of the soil on values is best discerned over broad areas Natural conditions are at their best in Iowa, Illinois, eastern Nebraska, and Kansas Land located in these sections has long borne the stamp of superiority in contrast with the land of New England and the eastern part of the United States in general Western arid or semi-arid lands, likewise, suffer in comparison with the more humid sections, much of them being fit only for wheat with low productivity or for grazing purposes The state of natural fertility of the soil is perhaps the most powerful element in determining the relative productivity and value of agricultural land in the United States.

Location and Accessibility.—Of decided importance also is the matter of location and accessibility of the farm. The matter of location is important, first, from the point of view of distance to primary markets for grain and live stock, as also for obtaining machinery and supplies. Freight rates and expenses of handling products are always greater in proportion to the distance from market For many years the products of California were worth only a nominal sum on account of the expenses of marketing and lack of organization among the pioneer farmers, the state being located far from the primary markets

Location and accessibility are also important from the standpoint of the immediate community where the farm is located. The distance of the

farm from town or a shipping point materially affects the expenses of hauling. This is especially noticeable at times of break-down of machinery which usually cannot be remedied short of a trip to town with the consequent delay. Level roads are decidedly important in reducing hauling expenses and saving time, since the distance may be covered with greater load in one-half or less time than in case of a hilly country, especially if rocks abound. The deterioration and repair of vehicles, automobiles, and machinery, due to rough roads, are often a matter of considerable importance, to say nothing of the loss of time occasioned by such conditions. A community that maintains its roads in good condition adds materially to agricultural prosperity.

Management.—The element of management also plays its part in farming. This may be observed in the maintenance of the fertility of the soil by proper rotations of crops and artificial fertilization when needed. The greatest drawback to farming in many states of the Northwest and South is the dependence upon one crop and the failure to raise stock and poultry for the market. The wheat or cotton farmer is dependent upon the season as also upon freedom from pests, such as the boll-weevil and army worm. Failure due to these causes leaves him with little or no income for the year. The diversified farming of the central states stands out in bold contrast as furnishing a relatively stable income to the farming class.

The matter of race or nationality is important. Negro farming of the South, as well as alien ownership in the North, does not bring the best results. On the other hand, the Americanized immigrants from western and northern Europe occupying a large portion of American farms today are a positive asset to the industry. They came from countries where conditions are hard and make the best use of their opportunities here with enviable results. The immigrant family is generally large, which gives advantages that come with the freedom from hiring labor at high prices. These elements affect the result just as surely as many others upon which so much emphasis is usually laid.

Prices of Farm Products.—Speaking more generally, the welfare of the farmer is dependent to a large extent upon the prices received for his products. The market for most of his products is world-wide and the American farmer finds himself in competition not so much with other American farmers as with those of other countries. While America is itself a comparatively new country, nevertheless there are countries of vast area, such as Canada, Australia, South America, and Russia, whose products come to the same world markets with those of the American farmer. This competition has proved very effective in the past in depressing the price of agricultural products. As modern methods of agriculture become more widespread, cost of production in other countries grows less, which, in turn, as new inventions lag, places the American

farmer at an ever-increasing disadvantage. The race between improvements and sinking prices cannot go on forever. Invention of labor-saving farm machinery seems to have about reached its limits. Little more can be expected from improvement in transportation in this country, while other countries are constantly improving their position by adopting American transportation methods.

The post-war period has been very trying for the American farmer living in the North who is afflicted on the one side by restricted European markets which had never failed before, and on the other by continued high production induced by temporary war prices for his products. His position is decidedly out of balance to his disadvantage and promises to continue thus for some time to come. The southern farmer is more fortunate if he succeeds in his battle with the boll-weevil and army worm. In addition, the southern farmer is not, except to a limited extent, in competition with other countries in the production of his main crop, producing as he does something like 60 per cent of the world's supply of cotton.

A statistical examination of the prices of agricultural products reveals remarkably wide fluctuations. Farm products are seasonal in their nature and slow to respond to increased demand, which often operates to produce wide variations in the prices. Market conditions are also often disturbed and are reflected in minor fluctuations. The farmer is of necessity somewhat of a speculator. Many of his products are of the staple variety, which induces him to make the attempt to market them at the best prices with the result, too often, that he sells them at relatively unfavorable figures. On the other hand, live stock prepared for the market cannot be held back without loss when ready for shipping. It is these forced conditions of farming operations that lead to the familiar fluctuations in the market prices of farm products and produce an uncertain income from year to year. Diversified farming is the most valuable corrective of a naturally uncertain situation which has yet been practiced or suggested. The numerous credit schemes advanced may assist to some extent, but most of these remind one again of the attempt to lift one's self with one's boot straps. Farm credit is already overextended, and a move toward its restriction in the future would result in lasting benefits. Even less efficacious is the tariff on many agricultural products, which has been the football of politics for generations. The tariff cannot help agriculture except in cases where farm products are imported into this country, as in the case of certain kinds of wool, dairy products, and the like. The great staple crops of wheat and cotton are still articles of export rather than import and are for the most part removed beyond the pale of influence of the tariff.

Farm Accounting.—In addition to the uncertainties just noticed, the farmer is further afflicted with the uncertainty of the method of calcu-

lating his income. By tradition the farmer keeps few or no accounts. While many methods of accounting procedure for the farmer have within recent years been devised by various individuals and agencies, farmers that actually keep systematic accounts which reveal their true financial condition are comparatively few in number. Brushing aside, therefore, all accounting theories as having little significance for present purposes, the essential factors in the situation may be briefly discussed.

While a considerable number of sources of revenue contribute to the gross income of the farmer engaged in producing the staple crops, the significant ones are few in number. The regular sources of income include the proceeds from the sale of grain and other crops, animals and animal products intended for the market, poultry and eggs, and dairy products. The usual minor and incidental sources of revenue include the value of animals raised for either draft or pleasure purposes, or for meat for home consumption, farm-produced fertilizers, lumber, logs and firewood from timber lands, and profits from trading in live stock, machinery, and so forth. Any true estimate of income would also include enhanced value of the farm itself with all of its appurtenances, if the increased value may be regarded as permanent, however unavailable this kind of income may be for the payment of interest and instalments on the principal on loans. Accurate calculation from year to year cannot neglect accruing values to animals both from their growth and advance in prices and increased prices of products on hand at the time the inventory is taken.

Although the calculation of the gross income of the farmer presents difficulties still unsolved, cost accounting presents problems of much greater complexity, many of them being well-nigh insolvable. First, certain costs are definitely ascertainable. Chief among which are outlays for wages of labor including both men and women directly engaged in farm operations as distinct from household activities, the cost of all materials and supplies, cost of threshing grain, allowance for board and keep of hired help engaged in farming operations, excluding, however, that employed in construction of permanent improvements, the cost of feed purchased for animals and poultry, the cost of repairs to machinery and improvements; veterinarian bills, and so forth.

The second group of costs is indefinite in amount and subject to different methods of calculation with widely different results. The value of the labor of women when engaged in other than household duties for the immediate family is almost impossible of definite calculation, however real it is in practice. Likewise, the value of the labor of boys and girls from an early age, without which most farms would not be operated at all, is indeterminable. Equally perplexing is the value of the services of the active manager of the farm who is also a laborer. No industry requires more careful attention to details and a broader knowledge than farming. The manager must be acquainted with soils, proper rotation of crops, and efficient

feeding of stock, and have ability to sell his crops and other products at advantageous prices. Who shall say what the services of the active manager are worth? In the absence of an employed manager class, any calculation of the salary due the manager for these services is little better than idle speculation. The income of the tenant farmer fails equally to furnish a criterion of wages for the labor of management.

Even if the foregoing difficulties could be removed, there would still remain the problem of depreciation, which seldom bothers the farmer but which is very real. Depreciation on improvements outside of the living accommodations of the family are real costs. Depreciation of farm equipment and improvements is very difficult to calculate, the result depending partly upon natural deterioration due to weather conditions. The life of machinery varies also with use and care. Likewise, the extent of soil depletion is uncertain and difficult to translate into financial terms where the ownership is of long standing.

From what has been said, it is obvious that the difficulties in the way of calculating the net income of the farmer are almost insuperable, relatively few farmers take the trouble of seriously attempting to ascertain its amount. From the standpoint of the payment of interest and instalments on the principal of mortgage loans, it is perhaps unnecessary to apply refined accounting methods. These obligations must be met in cash, and calculation of the cash income will perhaps give a more significant result for the money lender. Even here, considerable uncertainty remains. On the other hand, for the purpose of valuation of farm lands, the real net income should be definitely known. The problem of valuation of farm lands is more difficult than the valuation of city real estate because of the uncertain character of the income element.

The Value of Farm Property.—Traditional economic theory finds the value of farm land by capitalizing the earning power at the current rate of interest on investments. If to this is added the depreciated value of buildings and improvements, the total value of the farm unit is obtained. This method of valuation is of little use in practice, because the two mathematical factors upon which it depends are not ascertainable. It has already been shown that farm earnings are not subject to definite calculation. The current rate of interest on investments is inapplicable to this problem because farm lands are owned as a business and not as an investment. The capital employed in farming, as in all other businesses, brings no certain return and therefore the capitalization of the earning power on the basis of the interest rate, which represents a certain return on money, fails to take account of the risk to the capital employed. The logic of the situation would demand capitalization on the basis of expected profits, instead of the interest rate. When selling values are checked against the results obtained by the capitalization method, the inaccuracy of the latter is revealed. While the rate of interest in agricultural com-

munities is generally 6 per cent or more, the relation of earning power to selling values, it is said by agricultural experts, is less than 3 per cent. Translated into terms of value, capitalization on the basis of 3 per cent would yield twice the amount obtained by capitalization at 6 per cent. If the risk factor is taken account of, capitalization should be made on a much higher basis, thus revealing still further the defects of the capitalization method

The most practical method of ascertaining the value of farm property is by comparison of sale values. Comparison of the productive powers of farm lands will account for broad differences in value that exist in different geographical areas, as, for instance, New England farm lands compared with those of Iowa. New England lands suffer on account of their poor soil, those of the Red River Valley on account of the shortness of the season, those of western Kansas, Nebraska, and the Dakotas on account of the lack of moisture, and so on. Differences in productive qualities of individual farms affect values, a fertile soil, well drained, will always be worth more than poor soil suffering from an excess of moisture, provided other things are substantially equal.

Farms of equal productivity in the same community will differ in value according to their relative earning power, with attention to such factors as distance from the market, shipping point, and accessibility as previously described. Farming is characterized by a high operating ratio, which means that comparatively small additions to expenses cut deeply into net earnings. Minor differences in costs, therefore, become important for the net result.

A third economic factor in farm values is site value. This affects lands located on the outskirts of a city or town and is usually important in proportion to the rapidity of the growth of the city as it encompasses the adjoining farms. Site value is frequently of much greater importance than productivity or earning capacity. Taking account of proximity to markets, as well as site value, one author estimates that towns of 1,000 to 5,000 inhabitants will add to farm values within 3 miles' distance from 30 per cent for those most favorably situated down to nothing at the 3-mile limit, in case of cities of 5,000 to 50,000 inhabitants, the influence is felt for a distance of 6 miles, ranging from 50 per cent down to nothing, while cities of 50,000 or more inhabitants frequently increase values 100 per cent or more and add something to all farms located within 10 miles of the city.¹

Aside from the factors enumerated above, another group of influences not strictly economic have a decided influence on values. Perhaps in an absolute sense, the most potent of these factors is the inseparable character of the farm as a business unit from the farm as a home. Farming folks are among the most human, not to say sentimental, of all the classes

¹ IVAN WRIGHT, *Farm Mortgage Financing*, p. 190

of our population. They acquire an affection for the old home and the open country which clings to them. Pride of owning an estate is their ambition. They can rarely be persuaded to exchange the freedom and simplicity of farm life for city life with its complex and distasteful organization. This factor has undoubtedly pushed selling values of farms in most communities far beyond economic values. Some communities are composed of a single nationality or race, or of a religious sect, which shows itself in the tenacity of ownership and added prices. Where the farm population is further characterized by industry and thrift, farm values rise in response to increased earning power.

On the other hand, absentee ownership and tenant farming are too often responsible for depressed values. The incentive of the tenant to mine the farm is a strong force toward soil depletion. To all these price factors must also be added that of attractiveness of the farm and community as a home. Temperature and other climatic conditions determined to a large extent the character of the population in many of the larger geographical areas of the United States. The South is avoided by the people of the North on account of its excessive and constant heat, while the cold climate of the northern group of states repels the southerner. The location of the individual farm with reference to health, beauty of the surrounding country, and so forth, has its bearing also on farm values. Social values cannot therefore be neglected in farm lands.

Farm lands in the past have often been the object of speculation on a grand scale. Land located in the newer regions or on the fringe of settlement are frequently low in price for sheer want of people for settlement. Moreover, such lands are subject to speculation in anticipation of future increase in value which comes with the settlement of the country and the building of railroads, towns, and cities. In such regions, it is not infrequent for prices to discount values for 10 years ahead. Periods of business prosperity and depression are reflected through wide fluctuations in prices. Even in the older communities periods of agricultural prosperity stir the younger generation of farmers to acquire a home for themselves, while also inducing rank speculation on the part of others. If to these forces is added that of the real-estate speculator in farms, one has the explanation of temporarily increased prices. Succeeding periods of depression result in inability to pay for farms bought with borrowed money and to keep sale contracts. The result is that lands are thrown on the market in large quantities while purchasers are few, thus depressing prices below values. Such conditions are frequently of several years' duration.

The discussion so far has proceeded upon the assumption that improvements were well adapted to the land. It not infrequently occurs, however, that some lands have no buildings or other improvements beyond fencing and a drainage system. The value of such lands will be less by

the amount of the cost of appropriate improvements, which on the average, perhaps, amount to something like 15 per cent of the total value of the improved farm. On the other hand, when a farm has been over-improved, the excess improvements can seldom be realized in sale; under-improved lands, likewise, are worth less on account of a restricted market.

It is evident from the foregoing discussion that the price of farm property seldom corresponds to the comparative earning power. In every case the attempt should be made to arrive at the selling price as determined by all the factors in the situation. The emphasis to be placed upon the factors, other than the earning power, in the appraisal of land for loan purposes depends upon the permanence of the added values. The sure basis for the loan is found in the permanent value of the property to whatever source it may be attributable.

Federal Farm Loan System.—The Federal Farm Loan System was established in 1916 and is composed of two classes of institutions. The first class is made up of 12 Federal Land Banks conveniently located in various geographical sections of the United States. These are cooperative institutions and not intended to show a profit to their stockholders, who are ultimately the borrowers under the system. The second class is made up of Joint Stock Land Banks, which are unlimited in number and are strictly private institutions, operating for the profit of their stockholders under federal charter. All loans issued by both classes of institutions are supervised by the Federal Farm Loan Board, which is a bureau of the United States Treasury Department. According to a decision of the United States Supreme Court in 1921, both classes of bonds were held to be "instrumentalities" of the United States Government and exempt from all federal, state, municipal, and local taxation, excepting federal estate and inheritance taxes. The decision of 1921 first established the legal position of these institutions and their bonds and constitutes their real charter. It must not be supposed, however, that the bonds of either class are direct obligations of the government. The government in no sense guarantees the bonds, they must depend for their safety upon their inherent strength. Both classes of bonds are collateral trust mortgage bonds issued according to the principles explained above.

All loans made under the Farm Loan System are on the amortization plan and must be protected by first-lien mortgages and provisions guaranteeing the liquidation of mortgage loans in 5 to 40 years. Loans are made only to the extent of 50 per cent of the appraised value of the land and 20 per cent of the value of insurable permanent improvements. Joint Stock Land Banks cannot make a loan in excess of 15 per cent of their capital and in no case for an amount larger than \$50,000 to one individual. Federal Land Banks are restricted to loans of \$25,000 or less to one individual. Loans are made for the purchase of agricultural land; for equipment, fertilizers, and live stock necessary for farm opera-

tion, for buildings, under restriction, and for the liquidation of existing debts on the farm. The rate of interest to borrowers is fixed from time to time by the Federal Farm Loan Board, 6 per cent being the legal maximum. Joint Stock Land Banks are allowed a margin of 1 per cent between the rate charged the borrower and the return to the lender, 6 per cent being the maximum charged the borrower in this case also. The total outstanding bonds of any Joint Stock Land Bank cannot exceed fifteen times its combined capital and surplus, while twenty times the amount is allowed Federal Land Banks. The minimum capital of the former is \$250,000 and of the latter \$750,000. A reserve fund of 25 per cent of the net earnings in both cases must be set aside semi-annually until it reaches 20 per cent of the outstanding stock and thereafter 5 per cent annually. The maturity of bonds is prescribed by the Federal Farm Loan Board, most of the issues being callable at the end of 10 years and maturing in 30 years from the date of issue. They are sold in denominations of \$40, \$100, \$500, \$1,000, and \$10,000.

The amortization plan under which these bonds are issued results in an ever-increasing amount of property back of the bonds. As fast as instalments on the mortgages are paid by the borrowers, new mortgages must be deposited as collateral to cover the mortgage deficiency. The entire property back of the old and new mortgages is still available under the lien to satisfy the unpaid amount of the principal.

Federal Land Banks.—The basis of the Federal Land Banks is the Farm Loan Associations, each composed of at least 10 borrowing farmers who make application for at least \$20,000 of loans. Each borrower subscribes to the capital stock of the local association to the extent of 5 per cent of the amount he borrows. In turn the association subscribes for stock in the Land Bank to the extent of 5 per cent of all loans to the association. In the beginning the government subscribed to almost all of the capital stock of the Land Banks but gradually the capital owned by the associations increased until it is practically all thus owned at the present time. In reality the capital is furnished by the sale of bonds, the farmer receiving only 95 per cent of the loan for which he applied. Since 1923 the Land Banks have been managed by a board of directors consisting of seven members, three of whom are chosen by the associations, three appointed by the Federal Farm Loan Board at Washington, and the seventh chosen jointly by these agencies.

The Federal Land Banks under this arrangement have grown to occupy an important place in the farm-mortgage business of the United States. Mortgage loans outstanding at the beginning of 1930 totaled \$1,197,949,727. There were 4,662 associations on September 30, 1930, there were 410,227 loans outstanding. The Land Banks as a class prospered down to 1925, at which time their total net earnings amounted to \$34,964,938 and dividends paid \$25,750,662. The Omaha, Wichita,

and Louisville banks paid dividends at the rate of 8 per cent and the Houston bank 10 per cent. After 1925 dividends were reduced or omitted by most of the banks. In 1929 six banks paid no dividends. One omitted dividends already in 1924, one in 1925, three in 1926, and one in 1927. The Spokane bank became temporarily insolvent in 1925. In pursuance to the legal arrangement the 11 other banks came to the rescue of this bank and up to the close of 1929 they had advanced to the bank \$2,799,850. The insolvency of this bank was due to the overappraisals and unsound lending methods in the early history of the bank. Its later record has been greatly improved. On September 30, 1930, total capital of the 12 banks was \$65,935,226, special reserves against real estate, delinquent instalments, and so forth, were \$17,457,577, legal and other reserves \$13,289,504, and individual profits \$4,208,575.

Federal Land Bank Bonds.—The Federal Land Bank bonds are issued jointly by all 12 banks. Each bank is individually liable for the interest and ultimately for the principal of all the bonds of the entire 12 banks. The bonds are secured directly by United States Government bonds or mortgages on farms of an amount equal to the par value of the bonds. All farm mortgages must be first mortgages secured by land of twice the appraised value and permanent insurable improvements to the extent of five times their value. These bonds are, moreover, guaranteed by the National Farm Loan Associations of which the borrowers are members. The stock held by members carries double liability. Each year the issue is reduced through the amortization plan. Payments are semi-annual and identical throughout the entire period, usually 34 years. At the beginning of the period the interest payments greatly exceed the payment on the principal, while at the end of the period the situation is reversed. A \$1,000 loan to a borrower at $5\frac{1}{2}$ per cent for 34 years requires a semi-annual payment of \$32.50. The first payment at the end of 6 months is \$27.50 interest and \$5.00 principal, the final payment is \$0.87 interest and \$31.56 principal. The bonds are further protected by all of the capital stock, reserves, and undivided profits of the 12 banks. On March 31, 1931, these items totaled \$83,307,049; bonds outstanding were \$1,323,069,799.

These bonds are acceptable as security for government deposits, including postal savings funds. The act provides that they shall be lawful investments for all fiduciary and trust funds under the jurisdiction of the United States Government. They are also eligible under the laws of many states for investment of all public and private funds and for savings banks in at least 37 states. The bonds are sold extensively by banks and investment houses in all parts of the United States. They are issued for 30 years, as a rule, with an option for payment after 10 years. Denominations are for \$40 and \$100, or multiples thereof, up to \$10,000.

Land Bank bonds were considered to be well protected by conservative appraisals. On December 31, 1929, the 12 banks had loans of \$1,520,300,000 on land appraised at \$3,260,672,000 and buildings at \$900,244,000. The total real-estate holdings of the bank of Omaha, the largest, on June 31, 1931, were only seven-tenths of 1 per cent of the outstanding loans and against these a reserve of equal amount was carried, as is the policy of all of the banks. Besides this reserve the bank carried \$2,856,032 legal reserve and had capital of \$9,183,495,000 and total assets of \$175,690,152. The total number of foreclosures pending on December 31, 1929, was 1,921, representing loans with unpaid principal of \$6,311,000.

The prolongation of the depression throughout 1931 and 1932 was reflected in the condition of the Land Banks. The total number of loans delinquent on November 30, 1931, was 83,211, or 23 5 of all loans outstanding, whereas the year before the number was only 38,414, delinquent instalments on September 30, 1931, were \$12,042,000 against only \$5,357,000 of the preceding year. Most of the delinquencies, however, were only on current or recent payments and hence not likely to involve foreclosures. Only 3,848 foreclosures were pending on November 30, 1931, which was only nine-tenths of 1 per cent of the total outstanding.

Federal Land Bank bonds are quoted according to interest rate and maturity dates irrespective of any particular bank, thus 4s of 1957 optional 1937. Prices vary according to interest rates, and optional and maturity dates, while yields are quite similar. High claims made in the earlier days of the Farm Loan System have not been realized. In March, 1932, government bonds were yielding less than 4 per cent, while Land Bank bonds yielded 5 per cent. Their yield was considerably higher than that of the best railroad bonds during the depression years 1930-1932. Judged by their market performance Land Bank bonds are inferior to both government and high-grade railroad bonds.

Joint Stock Land Banks—Altogether over 80 charters for Joint Stock Land Banks have been granted. At the close of 1929 there were 48 in operation, the reduction having been due mostly to mergers, 3 were in the hands of receivers. Altogether these banks had outstanding, at the end of 1929, 103,731 loans aggregating \$626,979,717. At the same time the total capital paid in was \$41,743,060, legal reserves \$5,186,637, earned surplus and undivided profits \$4,838,470.

Joint Stock Land Bank Bonds—The bonds of the Joint Stock Land Banks are issued by each bank separately and protected by the resources of each bank alone. The bank's activities are confined to only two contiguous states and only a limited amount of diversification is possible. Owing to the large number of banks and the limited amount of the total loans, the average resources of each bank are small in comparison with the Land Banks. This again is a source of weakness. Since the banks

are not allowed to lend more than fifteen times their capital, the margin of protection behind the bonds must always be $6\frac{2}{3}$ per cent, which is doubled if the double liability attaching to the stockholders is taken into consideration. The total number of foreclosures pending December 31, 1929, was 691, representing loans with unpaid principal of \$5,391,000. Some of these banks charge off all real estate owned but most of them carry this item in the balance sheet at some figure. The Joint Stock Land Banks in some instances have suffered from poor management, which has detracted from the reputation of the entire group. The heavy defaults of 1931 and 1932 further depreciated the strength of the bonds in the eyes of the investors. The total delinquent instalments on farm mortgages held by all of the banks on December 31, 1931, was \$8,327,379, against only \$3,715,963 the year before. In both cases only about one-half of total delinquencies was for 90 days or more. At the end of 1931 delinquencies amounted to one-third of estimated bond interest. On that date also sheriffs' certificates, judgments, and so forth, amounted to \$10,924,661.

These bonds were generally selling at a discount of about 50 per cent at the beginning of 1932. None, however, was actually in default. These banks have been able to avoid losses and actually make a profit during the depression years by sale of lands acquired through foreclosure, at a price in excess of the price of the bonds outstanding against them. These bonds are legal investment for all fiduciary and trust funds under the jurisdiction of the government and acceptable for security of postal and certain other deposits of government funds.

The reorganization of the Kansas City Joint Stock Land Bank was completed in 1931. The bondholders were offered three options: (1) to receive 60 per cent of the principal amount of their bond in cash, (2) to receive 85 per cent of the principal amount in 5 per cent bonds of the new bank, (3) or to receive 85 per cent of the principal in $4\frac{1}{2}$ per cent bonds of the new bank and in addition an allotment of stock.¹

Joint Stock Land Bank Stocks.—The causes of disappointment in the action of the bonds of the Farm Loan System have found greater reflection in the stocks of the Joint Stock Land Banks. The unsatisfactory state of agriculture is doubtless fundamental in explaining the performance of the bonds of the federal system. But from the point of view of the financier, the stock carries too little equity in value as compared with the bonds. The stock of the Joint Stock Land Banks is less than 10 per cent of the assets, while the bonds constitute between 80 and 90 per cent. An industry thus heavily bonded places the bonds in a semi-speculative position, while creating a very much greater instability for the stock. The stocks of these banks, therefore, belong to the price

¹ Report of the Committee on Real Estate Securities of the Investment Bankers Association of America, 1931.

or pauper class During the period of tolerable conditions in agriculture during most of the decade from 1920 to 1930, the stocks of these banks gave a fair account of themselves and even joined the boom in 1928 and 1929 The deflation following saw a decrease in the value of these stocks scarcely equaled by any other class of enterprise During the worst phase of the depression, the best of them could have been bought for a mere fraction of par Notwithstanding this, actual liquidating values were well above the par value and earnings of some of the better institutions were several dollars per share Dividends, however, were either reduced or dropped in almost all of the banks The chief reason for the low state of these stocks is found in loss of confidence in the ability of the management to cope with the world-wide depression in the agricultural industry This has brought about a large number of foreclosures of loans presumed to be conservatively made, even though losses did not always follow this action

Farm-mortgage Indebtedness.—Total farm-mortgage indebtedness in the United States in 1910 has been placed at \$3,600,000,000, or 10.3 per cent of the value of farm lands and buildings In 1920 indebtedness stood at \$7,860,000,000, or 11.9 per cent of land and buildings In addition, in 1922 there was short-time indebtedness of \$3,870,000,000 Thus, in spite of the inflation of the war period, agricultural indebtedness increased faster than land values The Bureau of Agricultural Economics placed the total mortgage debt on January 1, 1930, at \$9,241,000,000, a decline of \$227,000,000 from the peak in 1928 Foreclosures and scaling down at the time of renewal accounted for the decrease.

If the matter is viewed from another angle, it is found that the average mortgage debt on mortgaged farms occupied by the owners in 1910 was \$1,715, in 1920 it was \$3,356, and in 1925 it stood at \$4,004 The average value of farm land and buildings per mortgaged farm was \$6,289 in 1910, and \$11,546 in 1920 After 1920 the tendency appears very unfavorable With an increase in mortgage indebtedness from 1920 and 1925, the value of land and buildings per farm decreased from \$10,284 to \$7,764 The average mortgage debt per mortgaged farm in 1920 stood at 33 per cent of the value of the land and buildings but increased to 50 per cent in 1925 Farmers are constantly confronted with the necessity of paying interest on increasing indebtedness with shrinking land values ¹

The position of agriculture has deteriorated materially since 1929 The Bureau of Agricultural Economics estimates the gross income of farmers in 1929 at \$9,300,000,000, and in 1931 at \$6,920,000,000, or a drop of 42 per cent The same bureau estimates that on January 1, 1931, approximately 38 per cent of mortgaged farms were mortgaged for more than 50 per cent of their value, 22 per cent from 50 to 75 per cent of their value, and 15.7 per cent for upward of 75 per cent of their value. In the

¹ See E. S. SPARKS, *Agricultural Credit in the United States*, pp. 441-443

face of this, the figures of the Bureau of Labor Statistics show that in 1931 farmers were paying 23 per cent more for the things they bought than they paid in 1913 and got only 70 per cent as much for their products. In 1920 the average interest rate on farm mortgages was 6.1 per cent, while the rate to farmers on short-time indebtedness averaged 7.23 per cent.

Experience in Nebraska.—From various official records the farm-mortgage history of Nebraska since 1890 may be reconstructed. The following tabulation of data is taken from *Nebraska Studies in Business* (No. 40).¹

TABLE 64.—EXTENT OF FARM-MORTGAGE DEBT IN NEBRASKA, 1890-1930

Year	Average value of land per acre	Average value of buildings per acre	Combined value of land and buildings per acre	Percentage of farms mortgaged	Debt per mortgaged acre	Percentage of debt to value of land and buildings	Maximum sound percentage of debt to value of land and buildings
1890			\$18.63	52.0	\$ 6.43	34.51	
1900	\$16.27	\$3.04	19.31	45.4	7.82	40.50	45.3
1910	41.80	5.15	46.95	39.4	10.59	22.55	46.7
1920	78.87	9.04	87.91	56.5	18.92	21.53	46.9
1925	50.53	9.48	60.06	56.5	26.02	43.32	45.1
1930	45.82	9.99	55.81	61.0	21.62	38.74	44.6

The author of this study remarks, "Along with the increase in farms mortgaged and the decrease in the equity of the farmer in his property has come an increase in the percentage of foreclosure." Comparatively few foreclosures occurred from 1900 to 1920. Data from mortgage and insurance companies indicate, however, that, in the decade following, foreclosures amounted to 0.5 to 3 per cent of the amount of the loans. The Federal Land Bank of Omaha experienced up to January 1, 1930, foreclosures amounting to 1.25 per cent of total loans, while foreclosures made by the Joint Stock Land Banks were considerably higher.²

Taxation.—Increased taxation has added greatly to the financial burdens of the farmer. For the 17 years prior to 1930 average taxes per acre of farm land increased 149 per cent. In 1913 the average tax rate on farm values was \$0.68, but this rate amounted to \$1.50 in 1930.

In addition to the heavy burden of taxation on farm property, the laws of many states still subject farm mortgages to heavy taxation under the general property tax. For example, suppose the general property

¹ *University of Nebraska Publication*, by the Committee on Business Research of the College of Business Administration, p. 9 (Study made by Martha C. Weaver.)

² *Ibid.*, pp. 10-11.

tax rate for state and local purposes is \$20 on the \$1,000 valuation, a 6 per cent mortgage for \$1,000 would return gross interest to the investor of \$60 per annum, but after paying the tax only \$40 would remain as net return, which is only 4 per cent on the investment. A tax-free Farm Loan bond selling on a 5 per cent basis under these circumstances would give a net return of 1 per cent greater. In 36 states, in substance, this situation still exists, while in many of these no effort is made to avoid double taxation resulting from assessing both the mortgage and the land. Some states exempt mortgages entirely from taxation, this is the case in Arizona, Connecticut, Delaware, Idaho, New Jersey, and Washington. A few states tax mortgages only at a low rate, Pennsylvania, for example, levies annually 4 mills on the dollar. In other states, among which are New York and Missouri, a low mortgage-recording tax is levied at the time of issue, and thereafter the mortgage is exempt from the property tax.

Causes of Agricultural Depression.—Agriculture has been in a state of relative depression since the World War. In brief, the economic causes are not far to seek. The most far-reaching of all is the world-wide agricultural situation. Everywhere overproductive capacity was created by the high prices during the war. This resulted in decline in the prices of agricultural products relative to other commodities. The breakdown of international credit in 1931 still further aggravated the condition of agriculture throughout the world. Following this came the movement toward tariffs in the leading countries, which still further restricted trade in commodities of all sorts. Many other minor causes of farm depression could be mentioned in this connection but only the major causes will be mentioned here. Reduction in world tariffs and removal of other restrictions on international trade are the *sine qua non* of future agricultural, as well as of general, prosperity.

Market for Farm Mortgages.—It was estimated that in 1914 about 31½ per cent of all farm mortgages were held by banks and farm-mortgage companies, about 37½ per cent by life insurance companies, and 31 per cent by private investors and endowment institutions¹. In 1921 the mortgage companies had approximately \$3,200,000,000 of the estimated total of \$8,000,000,000, or 40 per cent, life insurance companies about 15 per cent, and the Federal Farm Loan System 6 per cent. During the past decade life insurance companies have steadily increased farm-mortgage holdings to \$1,960,284,000 on June 30, 1932. On June 30, 1931, all banks in the United States held \$443,472,000 in farm mortgages. The Federal Farm Loan System on March 31, 1931, had net loans of \$1,733,880,000. Within recent years North and South Dakota and Minnesota organized state systems of farm-mortgage credit. These had loans outstanding

¹ R. L. Cox, *Proceedings, ninth Annual Meeting of the Association of Life Insurance Presidents, 1915.*

in 1929 of \$103,145,000, against which bonded indebtedness was created to supply the funds ¹

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¹ SPARKS, *op cit.*, Chap XV

PART IV
THE FIELD OF INVESTMENT, PUBLIC OBLIGATIONS

CHAPTER XXXII

UNITED STATES GOVERNMENT BONDS

From its inauguration in 1789 down to the present time, the Government of the United States has been wedded to the policy of debt-payment. This contrasts sharply with the policy of the Governments of England, France, and Germany which regard their internal obligations as perpetual. A review of the debt record of the United States shows how consistently the government has followed the policy of debt-payment.

Early Debt Record of the United States—The record of the debt of the United States Government properly begins with the revolutionary period. The debt of the Confederation in April, 1783, exclusive of state debts, amounted to \$42,000,375, upon which the annual interest charge was \$2,415,956. The Confederate Congress found the debt unmanageable, partly on account of a defective central government; also, because the imports after the war of independence drained the country of its specie, making it all but impossible to obtain sound currency even in comparatively small amounts. The only method open to Congress to raise money was through requisitions upon the states, but it had no authority to enforce these requisitions. As a consequence up to September 20, 1787, only \$1,003,725, or less than 6 months' interest had been collected, the balance in the interval going by default. Even the interest on obligations held abroad had remained unpaid for several years. After 1787 default on the payment of instalments of the principal held abroad also occurred.

The unsound condition of the finances, both of the states and of the confederation, was the impelling motive which led to the formation of the new government. Public credit had vanished, many of the obligations selling as low as \$10 on \$100 of the face value, while others were practically without any market value at all; American public obligations were dishonored and despised. With the inauguration of Washington's administration in 1789, the first great task of the new government was to set the finances of the country in order. The genius for this task was at hand in the person of Alexander Hamilton, who became secretary of the treasury. The vastness of the difficulties may be appreciated when it is remembered that the United States had no currency of its own, practically no banks, no mines where precious metals could be obtained, nor had any system of taxation been evolved. Continental bills of credit floated about as so much worthless paper. Worst of all, there was the mass of debts originating with the different states and the

Continental Congress Loss of confidence in the financial situation was complete Hamilton attacked the problem in the broadest possible way by evolving a comprehensive scheme for setting the currency in order, for taxation to provide the new government with revenues, for the establishment of a banking system, and for the payment of the debts Our concern is only with the last of these

In order to see the matter in its true light, the amount and character of the debts which confronted the new government must be kept in mind A reliable estimate of the debts assumed by the new government gives the following:

Foreign	\$12,556,874
Domestic (confederation)	40,256,802
Domestic (states)	19,962,219
Total	<hr/> \$72,775,895

In 1790 about one-third of the domestic debt consisted of arrearages in interest caused by default of the confederate and state governments, while arrears on foreign interest amounted to \$1,640,071 The wealth of the 13 states in 1790 is estimated by Mulhall to have been \$619,200,000, or less than ten times the debt assumed There was serious discussion in the new Congress and in the press as to whether the country was able to pay its debts. Although the amount of the debt was unprecedented, it is probable that currency difficulties were chiefly responsible for the widespread skepticism that prevailed There was no difference of opinion in regard to the foreign debt, it was considered by all a prior claim on the finances of the country and agreed that provision should be promptly made to refund it in its entirety. But the domestic debt was composed of a heterogeneous mass of obligations, bearing many different guarantees of redemption Many had accepted large losses already, either by sale or through the use of the obligations as currency. Speculation was very great, since the probability of redemption in many cases was remote The chief discussion centered around the payment of state debts which, like the confederate debt, had been contracted for the prosecution of the war.

It was due to the financial ability and influence of Alexander Hamilton that Congress in 1790 made arrangements to pay both interest and principal, including arrearages, on both the domestic and foreign debts by pledging specific revenues and the annual surplus above what was required for ordinary expenditures. He saw that the future of public credit was at stake and the only way to establish confidence in the new government was the honorable discharge of all public obligations outstanding In spite of strong popular feeling in favor of partial repudiation, Hamilton was uncompromising in his contention that the government should abide by the contracts as represented in the obliga-

tions This idea prevailed, except for some reduction in the rate of interest on the refunding obligations and the Continental bills of credit which were refunded at the rate of 1 per cent of their face value By 1798, the credit of the government was so far restored that a loan of \$5,000,000 was floated in Holland on an 8 per cent basis Hamilton's achievement in refunding the debt stands as an extraordinary example of sound finance and should serve as an inspiration for all time

The financial difficulties of the first decade of America's national existence were great. They were a legacy for the most part of the revolution, the states having been left economically stranded and regarded as outcasts by England, with whom they had formerly maintained close economic relations Revenues were hardly sufficient to meet the expenses of government New floating debts were created at high rates of interest, until in 1801 the debt amounted to \$80,038,050. In the meantime, however, interest payments were regularly made on all obligations at home and abroad The confidence in the new government is shown by the distribution of the debt in 1803.¹

Foreign		
England	.	\$15,882,000
Dutch		13,693,000
Other	.	2,542,000
Domestic		
Owned by states	..	5,603,000
Owned by incorporated bodies	.	10,096,000
Owned by individuals	.. .	22,330,000
Total	.	\$70,146,000

The Second Period.—The administration of Thomas Jefferson, with Gallatin as secretary of the treasury, brought a new and rigorous policy of retrenchment into the national finances For the first time the American policy of debt-payment was vigorously put into practice Although the Louisiana purchase in 1803 was responsible for an increase of \$11,250,000 in the indebtedness, the net debt was reduced to about \$42,000,000 in 1812, while the amount of the principal paid was approximately \$50,000,000 At that rate the debt would soon have been entirely extinguished, but the second war with England in 1812 raised the figures higher than ever before In 1816 the debt stood at \$127,334,933 The new loans had been made at a nominal rate of 6 per cent and were mostly sold at 88, which was equivalent to a 7 per cent straight return.

The policy of debt-payment was asserted with full effect after the War of 1812 Heavy taxation, liberal sinking-fund provisions, and large surplus revenues after 1823 rapidly reduced the debt, until in 1836 the entire amount including both interest and principal was completely

¹ TIMOTHY PITKIN, *Statistical View of the Commerce of the United States*, Chap. II.

discharged and the United States stood out in contrast with the more powerful nations of the world as a debt-free country. There is no doubt but that the policy of debt-payment was the main argument for the large amount of foreign capital which came to the United States during this period to assist in internal improvements and the general development of the country.

Little further borrowing was done in spite of the disastrous panic of 1837 until the Mexican War, which occasioned the borrowing of some \$50,000,000. These loans were floated at par on a 6 per cent basis. The debt gradually increased until 1851, when it amounted to over \$68,000,000. The general prosperity of the country, however, following the discovery of gold in California, was reflected in the reduction of the debt to approximately \$10,000,000 in 1857. The panic of 1857, revenue deficits, Indian troubles, bad financial management, and the approaching Civil War saw the debt increased again to \$90,580,873 in 1861. Thus, at the opening of the Civil War, the debt was rapidly increasing, the treasury was depleted, and the credit of the government had sunk to a 12 per cent basis. The record of these years is one entirely to the discredit of the treasury officials and shows how the good faith of the government, so thoroughly established, could all but be destroyed by an incompetent and halting administration.

The Civil War and After.—Then came the election of Lincoln as President and, with it, the Civil War was precipitated. The total amount of the debt occasioned chiefly by the war, including both interest- and non-interest-bearing obligations, reached a maximum of \$2,800,000,000 in 1865. The currency rate of interest on the average for the different flotations during the war was approximately 6 per cent. These bonds, however, were mostly payable in coin and the actual gold rate of interest was, therefore, much higher, the high point being reached in 1864 when currency at one time was worth only 38 7 cents on the dollar, making the interest rate about $15\frac{1}{2}$ per cent in gold.

Against a national debt upward of \$2,500,000,000, the wealth of the United States in the census of 1860 had been officially placed at something over \$16,000,000,000; in other words, the debt was almost one-sixth of the wealth of the country. In 1861 the per capita debt was less than \$3, while, in 1865, it stood at over \$75. It is little wonder, therefore, that such a prodigious increase in the federal debt raised grave doubts in the minds of many as to the ability of the government finally to pay it off. To use the words of another, when the debt became burdensome "the specter of repudiation spread its wings over the land, and for a time the good name of the nation even trembled in the balance—a proposition being boldly made to pay the bonds in greenbacks." Most bonds were payable in coin, and it was a matter of current discussion whether this part of the obligation could be complied with.

Notwithstanding the unsound currency situation, Congress was vigorous in its methods of taxation and provided ample funds to meet all expenses and interest payments on the debt. In the light of current European finances, no policy of the government stands out in bolder relief and soundness in principle than this post-war taxation policy. In addition to this, McCulloch, secretary of the treasury, was influential in getting Congress to pass the Public Credit Act, in 1869, which pledged the good faith of the government to meet all obligations, including both interest and principal, in coin. By the Refunding Act of 1870, provision was made for borrowing \$500,000,000 at 5 per cent, \$300,000,000 at $4\frac{1}{4}$ per cent, and \$1,000,000,000 at 4 per cent. All were to be sold at par or more, in gold, and were made payable in coin and exempt from all national, state, and local taxation. Following this came the Resumption Act in 1875, which placed the currency on a sound basis once again. These measures had the desired effect in thoroughly restoring the credit of the government, which gradually improved until 1880 when new loans could be floated on a $3\frac{1}{4}$ per cent basis.

Bond issues of considerable size were floated in connection with the resumption of specie payments in 1879. But in spite of the loans of 1879, the total outstanding debt of the United States decreased gradually from the high mark of 1865 until, in 1892, the total interest-bearing obligations amounted to only \$585,029,330. The treasury was replete with funds from the McKinley and other tariff measures, as well as from internal revenue receipts. The policy of debt-payment was succeeding too well, for there was great scarcity of government bonds for the security of national bank notes. So great was this demand that a premium of 30 per cent was offered by banks for these issues. Had it not been for currency demands, there is little doubt but that the debt would again have been extinguished.

During President Cleveland's second administration, the question of a standard form of currency arose and was made a political issue. The discovery of silver in large quantities in Colorado and other places, taken in connection with an insufficient gold supply, gave rise to a strong demand for the bimetallic standard. Government bonds were payable in "coin", there arose a demand for payment in silver. Against the wishes of his own party, the President stood for payment in gold. Bonds were accordingly issued in considerable amounts in order to obtain gold to replenish the reserves and maintain the parity of all kinds of currency. Although this increased the burden of the debt considerably, it restored confidence in the good faith of the government in meeting its financial obligations.

Further loans were floated to finance the Spanish-American War, to pay the Philippine indemnity, and later to construct the Panama Canal. These loans altogether increased the total interest-bearing debt

to \$971,562,590 on July 1, 1916, the year previous to the entrance of the United States into the World War

The World War—The World War brought unprecedented financing to the United States as it did to the other participating nations. From the comparatively insignificant figures before the war, the debt reached a maximum of \$26,596,701,648 on August 31, 1918. A large portion of this, however, was incurred for the assistance of foreign allied governments, the proceeds of which were largely spent in the United States for war supplies and relief credits. The original amounts advanced to foreign governments amounted to \$10,317,000,000, of which some \$7,077,000,000 was advanced prior to the armistice and the balance, \$3,240,000,000, afterwards, the latter chiefly to satisfy contracts previously entered into.

In the spring of 1923 Great Britain made arrangements for the settlement of her portion of the obligations. It was agreed between the two governments that final settlement will be made in 1984, and that for the first 10 years, the debt (amounting to \$4,600,000,000 after adjustments for interest) will draw interest at the rate of 3 per cent, and for the 52 years following at the rate of $3\frac{1}{2}$ per cent. One-half of 1 per cent is added annually as an amortization fund. For the first 5 years the British Government may defer one-half of the interest due if desired, which amount would then be added to the principal. It may also pay any part of the principal above the amortization fund upon any interest date by giving 90 days' previous notice. All payments of either interest or principal may be made in bonds of the United States Government issued since April 6, 1917, such bonds to be accepted at par and accrued interest.

Similar arrangements were made with most of the other debtor countries. On November 15, 1931, Armenia, Nicaragua, and Russia had not yet funded their portion of the debt, the principal and interest of which amounted to \$337,323,000, all but \$14,370,000 of which was owed by Russia. On November 15, 1931, the total payments made by foreign governments and the amounts still owing the United States were as shown in table on page 615.

The Moratorium.—In order to avert, if possible, the serious international crisis which was threatening, on June 20, 1931, President Hoover proposed a moratorium for all inter-governmental debts for 1 year. After some weeks of negotiation this proposal was accepted by all nations concerned except Yugoslavia. By this arrangement the total payments due the United States and suspended for the fiscal year 1932 amounted to \$252,566,803.¹

Retirement Provisions.—Proceeding upon the theory that governments should pay their debts, the United States Government from

¹ *Annual Report of the Secretary of the Treasury*, 1931, p. 83.

TABLE 65—TOTAL INDEBTEDNESS AND PAYMENTS MADE BY FOREIGN COUNTRIES TO THE UNITED STATES, NOVEMBER 15, 1931

Country	Total indebtedness (payments on principal deducted)	Total payments received
Armenia	\$ 19,019,107 49	
Austria	23,752,217 00	\$ 862,668 00
Belgium	400,680,000 00	52,191,273 24
Cuba		12,286,751 58
Czechoslovakia	167,071,023 07	18,304,178 09
Estonia	16,466,012 87	1,248,432 07
Finland	8,604,000 00	2,954,685 27
France	3,863,650,000 00	486,075,891 00
Great Britain	4,398,000,000 00	1,911,798,298 67
Greece	31,516,000 00	3,091,936 01
Hungary	1,908,560 00	468,466 32
Italy	2,004,900,000 00	97,584,421 90
Latvia	6,888,664 20	634,166 79
Liberia		36,471 56
Lithuania	6,197,682 00	1,128,580 22
Nicaragua	352,627 99	168,783 13
Poland	206,057,000 00	22,646,297 55
Rumania	63,860,560 43	4,761,945 76
Russia	317,953,006 37	8,748,878 87
Yugoslavia	61,625,000 00	2,588,771 69
	\$11,598,501,461 42	\$2,627,580,897 72

Annual Report of the Secretary of the Treasury, 1931, p. 551

the very beginning of its history issued only comparatively short-time obligations. No United States obligation, except the Panama 3s of 1911, which mature in 1961, and bonds eligible for security of bank-note circulation, can be recalled whose maturity date was longer than 30 years; the vast majority of all loans were of much shorter duration. No Liberty bond runs longer than this, the bulk of these, as of other loans in the past, carry a redemption privilege long before the maturity date. This is in striking contrast to the former practice of European governments which created perpetual obligations, upon the theory that debts to their nationals need not be paid. A government bond that matures within a few years is surely superior to one with long-time or indefinite maturity.

In addition to this, from early times down to the present, it has been the policy of the government to attach sinking-funds to bond issues. The original funding act was passed in 1790 under the leadership of Alexander Hamilton, the master financial genius of the time. This act pledged the revenue from the sale of public lands and certain other surplus revenues to the retirement of the revolutionary debt. Subse-

quently, the interest on the redeemed portion of the debt still outstanding was pledged to retire obligations. Likewise, in 1817, Congress pledged the revenues from customs, tonnage, internal revenue duties, and sales of public lands to the extent of \$10,000,000, which was to be appropriated annually to retire the debt created by the war with Great Britain in 1812. The obligations incurred during the Civil War were protected by a sinking fund derived from the duties on imports sufficient to cancel 1 per cent of the debt annually. The debt, however, was canceled faster than the sinking fund demanded. From 1879 to 1890, it was reduced from \$1,996,000,000 to \$891,000,000, "a debt extinguishment without parallel in the history of any nation."

The present interest-bearing debt of the United States is substantially lower than it was at its peak in 1919. In 1930 the total outstanding debt was under \$16,000,000,000, which was approximately \$10,000,000,000 reduction from the peak. Owing to treasury deficits and other causes, the debt mounted by several billion dollars during the following years.

Retirement of \$1,965,791,450 was effected through a bond-purchase fund provided by the second Liberty Loan Act to run till July 2, 1922. An additional amount was retired through a law affecting all Liberty Loans, except the First $3\frac{1}{4}$ s, which authorized the purchase of 5 per cent of the original issues outstanding annually until 1 year after the expiration of the war. A more important stipulation, however, was included in the Victory Loan Act, affecting all Liberty bonds. A special annual sinking fund was created beginning July 1, 1920, equal to $2\frac{1}{2}$ per cent of the Liberty bonds and Victory notes outstanding on that date, less obligations of foreign governments held at that time. This fund may be used by the secretary of the treasury to purchase in the open market or otherwise the outstanding bonds and notes at an average cost not to exceed par and accrued interest. The interest which would have been payable on the bonds and notes thus redeemed is also to be added to the $2\frac{1}{2}$ per cent annual charge. Under this provision up to June 30, 1931, \$3,579,128,300 bonds and notes had been retired. Provision was made also whereby all payments received from foreign governments on account of the war debts were to be used to retire the federal debt, up to June 30, 1931, these amounted to \$2,627,580,897 72. The franchise tax on the Federal Reserve and Intermediate Credit banks is also used to purchase bonds for the reduction of the debt. At the above date total franchise taxes amounted to \$150,256,096 88. Funds from estate taxes are also applied to retirement of the debt.

Present Outstanding Bonds.—Details of the present outstanding bonds of the United States on December 31, 1931 (except Postal Savings $2\frac{1}{2}$ per cent bonds), are contained in the following compilation by C. F. Childs and Company:

TABLE 66—DETAILS OF OUTSTANDING UNITED STATES GOVERNMENT BONDS
(Not including postal savings 2½ per cent bonds)

Issue	Date of issue	Maturity	Redeemable*	Interest dates	Amount outstanding, Dec. 31, 1931	Denominations and forms	Notations (see footnotes)
Creeping bonds							
Cosolid 2s, 1930	April 1, 1930	Indefinite	After April 1, 1930	Jan. 1, April 1, July 1, Oct. 1	\$ 599,724,059	Coupon \$50, 100, 500, 1,000 (no coupons after 1930) Registered \$50, 100, 500, 1,000, 5,000, 10,000, 50,000	(1)
Panama 2s, 1933/16	Aug. 1, 1936	Aug. 1, 1936	After Aug. 1, 1916	Feb. 1, May 1, Aug. 1, Nov. 1	{ 48,954,180 25,967,400 }	Not convertible from registered into coupon Coupon \$20, 100, 1,000	(1)
Panama 2s, 1933/18	Nov. 1, 1933	Nov. 1, 1938	After Nov. 1, 1918	Aug. 1, Nov. 1	{ 48,954,180 25,967,400 }	Not convertible from registered into coupon Coupon \$20, 100, 1,000, 10,000	(1)
Old issues							
Panama 3s, 1931	June 1, 1931	June 1, 1931	No option	Mar. 1, June 1, Sept. 1, Dec. 1	49,800,000	Coupon \$100, 500, 1,000 Registered \$100, 500, 1,000, 10,000	(1)
Conversion 2s, 1946	Jan. 1, 1916	Jan. 1, 1946	No option	Jan. 1, April 1, July 1, Oct. 1	{ 15,751,000 13,133,500 }	Not convertible from registered into coupon Coupon \$100, 1,000	(1)
Conversion 3s, 1947	Jan. 1, 1917	Jan. 1, 1947	No option	Jan. 1, April 1, July 1, Oct. 1	{ 15,751,000 13,133,500 }	Registered \$100, 1,000, 5,000, 10,000 Not convertible from registered into coupon	(1)
Liberty bonds							
First 3½s, 1947/33	June 15, 1917	June 15, 1947	June 15, 1932	June 15, Dec. 15	1,302,236,359	Coupon \$25, 100, 500, 1,000, 5,000, 10,000, 100,000 Registered \$100, 500, 1,000, 5,000, 10,000, 50,000, 100,000	(1)
First converted 4s, 1947/32	Nov. 15, 1917	June 15, 1947	June 15, 1932	June 15, Dec. 15	5,029,450	Are interchangeable	(2), (3)
First converted 4½s, 1947/32	May 9, 1918	June 15, 1947	June 15, 1932	June 15, Dec. 15	532,495,059	Coupon \$50, 100, 500, 1,000, 5,000, 10,000, 100,000	(2), (3), (4)
First second conv 4½s, 1947/32	Oct. 24, 1918	June 15, 1947	June 15, 1932	June 15, Dec. 15	3,462,150	Registered \$50, 100, 500, 1,000, 5,000, 10,000, 50,000, 100,000	(2), (3), (4)
Fourth 4½s, 1933/33	Oct. 24, 1918	Oct. 15, 1938	Oct. 15, 1923	April 15, Oct. 15	6,298,113,459	Are interchangeable	(2), (3), (4)
Treasury bonds							
Treasury 4½s, 1932/47	Oct. 15, 1922	Oct. 15, 1947	Oct. 15, 1932	April 15, Oct. 15	753,883,300	Coupon \$100, 500, 1,000, 5,000, 10,000, 100,000	(2), (3), (4)
Treasury 4s, 1934/44	Dec. 15, 1924	Dec. 15, 1954	Dec. 15, 1944	June 15, Dec. 15	1,039,834,500	Registered \$100, 500, 1,000, 5,000, 10,000, 50,000, 100,000	(2), (3)
Treasury 3½s, 1936/46	Mar. 15, 1926	Mar. 15, 1956	Mar. 15, 1946	Mar. 15, Sept. 15	499,087,100	Are interchangeable	(2), (3)

TABLE 66 — DETAILS OF OUTSTANDING UNITED STATES GOVERNMENT BONDS — (Continued)

Issue	Date of issue	Maturity	Redeemable*	Interest dates	Amount outstanding, Dec 31, 1931	Denominations and forms	Notations (see footnotes)
<i>Treasury Bonds (Continued)</i>							
Treasury 3½, 1947/43	June 15, 1927	June 15, 1947	June 15, 1943	June 15, Dec 15	470 412 750	Coupon, \$50, 100, 500, 1 000, 5 000, 10 000, 100 000	(2), (3)
Treasury 3½, 1943/40	July 15, 1928	June 15, 1943	June 15, 1940	June 15, Dec 15	865 356 450	Registered \$50, 100, 500, 1 000, 5 000, 10 000, 50 000, 100 000	(2), (3)
						Are interchangeable	
Treasury 3½, 1943/41	Mar 15, 1931	Mar 15, 1943	Mar 15, 1941	Mar 15, Sept 15	577 539 000	Coupon \$50, 100, 500, 1 000, 5 000, 10 000, 100 000	(2), (3)
Treasury 3½, 1945/46	June 15, 1931	June 15, 1946	June 15, 1946	June 15, Dec 15	921 406 000	Registered \$50, 100, 500, 1 000, 5 000, 10 000, 50 000, 100 000	(2), (3)
Treasury 3, 1945/51	Sept. 15, 1931	Sept 15, 1951	Sept 15, 1951	Mar 15, Sept 15	890 423 000	Registered \$50, 100, 500, 1 000, 5 000, 10 000, 50 000, 100 000	(2), (3)

From O F Childs and Company

Tax Exemptions — No issue is exempt from estate and inheritance taxes. All issues are exempt from all state and local personal-property and income taxes.

(1) Fully exempt as to interest from all federal income taxes

(2) Exempt as to interest from only normal federal income taxes.

(3) Interest from \$5 000 principal in the aggregate, of Liberty 4, 4½, Treasury 3, 3½, 3½, 4, or 4½ is exempt from surtaxes for the life of the issue.

* Redeemable at the government's option in the year indicated on the same day and month as maturity date, or on any interest date thereafter. When bonds are "called" for redemption, advance notice must be given of 3 months for Liberty 3½, First 4 and 4½, First-second 4½, 6 months for Fourth 4½ 4 months for Treasury 3, 3½, 3½, 4, and 4½. The Counsel

2, and Putnam 2, are redeemable "at the pleasure of the Government" after their redeemable date, no provision for "noting" is specified.

The Government Contract.—The Constitution of the United States authorizes Congress to borrow money on the credit of the United States, without restriction as to amount or purpose. Bonds and other obligations of the government issued under this authorization are promises to pay. In giving its promise, however, the government is in a different position from that of individuals. While individuals can be sued for non-performance of contracts, the government is the sovereign authority and, therefore, cannot be sued. The government is master of its own house, subject only to the will of the people expressed in the constitution. There is no power outside the people that can force the government to keep its contracts. Moreover, the first and supreme duty of any government is the preservation of the state. In order to accomplish this purpose obligations will be swept aside if necessary. Repudiation is within the power of every sovereign authority.

The situation is, however, not so hopeless as it may seem at first sight. The mere fact that the government has promised to pay its obligations is an acknowledgment of the debt and as such has a certain binding force which would not exist without the promise. The same may be said in regard to other contractual provisions. Obligations payable within a short time, such as most United States Government bonds, give more assurance than if payment were to be made only in the indefinite or distant future. Likewise, the policy of attaching sinking funds to bond issues has proved a very valuable arrangement in the past and has been largely responsible for the success of the debt-payment policy followed from the beginning. Thus while government contracts do not have the coercive force of a superior authority back of them, they, nevertheless, have elements of great strength.

Payable in Gold.—Before the Civil War, government obligations made no mention of the kind of money with which they were to be paid at maturity. Since gold and silver were the only kinds of legal-tender money at that time, obligations were paid in either metal. Some of the Civil War obligations were made payable in coin, while others were left indefinite. With the issue of the greenbacks as legal tender, the question arose after the war as to whether government obligations could be paid in greenbacks. In order to remove this uncertainty, in 1869 the Credit-strengthening Act was passed, which solemnly pledged the payment of all obligations in coin, except those that were specifically payable in some other currency. Under the Refunding Act of 1870, all refunding bonds were made payable in coin. All United States bonds floated prior to the Gold Standard Act of 1900, including those of the Spanish-American War, were payable in coin without specifying either gold or silver. The Refunding Act of 1900 required the payment of all bonds issued under its provisions to be in gold. This act, together with that of the Currency Act which requires the secretary of the treasury

to keep all kinds of money at a parity with gold, placed the United States on a firm gold-standard basis and insured the payment of all its obligations in gold, no matter when issued. The gold provision should be looked upon as a mark of strength which an emergency may make very valuable.

The Burden of a National Debt.—At this juncture it is profitable to examine the several methods ordinarily employed in measuring the burden of a national debt. Perhaps the method most often used is that which expresses the burden in terms of the per capita debt. This is a useful method of showing the growth of a debt in a particular country but tells little or nothing as to the actual burden. It is customary to compare the per capita debt of one country with that of another to show the relative burden. Countries whose economic circumstances are similar may be thus profitably compared. But a country whose economic existence is largely based upon the lavishness of nature, where the necessities of life are obtained with little or no effort and where on this account little capital has been accumulated, cannot be compared with profit with another country whose people have accumulated a large amount of capital. A per capita debt of, say, \$25 in each country would bear much more heavily on the former than on the latter. England and America may be profitably compared, but not England and Greece, or America and India. In any case, the per capita debt shows nothing positive concerning the burden of the debt.

Another common index to the burden of a debt is the amount of the principal of the debt itself. This is good as far as it goes, but it neglects the interest charge. A striking illustration of this was found in 1870, when not only the debts of France and the United States but also the population of the two countries were approximately the same. The interest rate in France was only about 3 per cent, while in the United States the average was about 6 per cent, thus making the interest burden twice as great in the latter country. At the present time, however, the interest charge on the public debt in the United States is only about 4 per cent on the average, while in France and some other countries it is approximately 6 per cent. The debt of Germany showed, on the average, in 1919 interest at the rate of about 5 per cent, while Italy paid 7 per cent.

Frequently the proportion of the total annual expenditures of a government represented by the debt charge is used to indicate the burden of a debt. This method has much value if the economic revenues of the government are first deducted so as to show the proportion of taxes used for interest charge.

The method of most significance in estimating the burden of a debt is a comparison with wealth and income statistics. The proportion of the debt to the amount of national wealth shows the proportion of wealth

the government has mortgaged. Likewise, the total interest charge on the debt compared with the total net income of the people of a country is the best index of the burden of the interest charge. The latter method has not frequently been used, largely perhaps because statistics have not hitherto been available.

The Wealth of the United States.—It is frequently said that the only security of a government bond is the promise to pay. No greater mistake could be made. This is true only on the assumption that there is something with which to pay. Promises of individuals are usually valued in proportion to their ability to "make good." It is the same with a government. The government of a country possessing comparatively little wealth has a limited borrowing power. But where the people have shown thrift in the accumulation of property and advancement in production, borrowing power is correspondingly great. Nothing is more common in estimating the credit of a nation than to inquire into its economic position. The natural resources, their character and amount, the accumulated wealth and industry of a people form the sure basis of national credit and give vitality to the promises of governments to pay. Of almost equal importance with these things is the tendency of growth as revealed by statistics extending over many years in the past.

No country is better situated than the United States in these respects. Its natural resources are great in amount and extremely diversified in character. With a broad and diversified agricultural basis, ample supplies of fuel and essential metals of all kinds, and raw materials in abundance, the country is, economically speaking, almost entirely self-sufficient. It is owing to this that the United States foreign trade has never been of determining importance. In addition to its natural resources, the country's industries are equally diversified. The permanent welfare of a people so fortunately situated as that of the United States cannot be questioned if only reasonable thrift is exercised. In addition to this, wealth continues to grow at a rapid pace.

It may be said that the wealth of a country is not available for debt-payment. This is true if one is thinking of capital levies, which have never yet been resorted to in this country, although there has been agitation of this matter in Europe and actual adoption of such a tax in some instances. The resources of a country are important as a basis of national credit chiefly as they represent potential earning power in the future. As has been pointed out, the amount of capital possessed by a people is a good index to its earning power. Debt-payment is ordinarily made through taxation of the annual income, which is derived in a country like the United States almost entirely from some form of capital or natural resources. This constitutes the enduring importance of wealth as a support of national credit.

It cannot be said what portion of national wealth can be safely mortgaged by indebtedness. In practice, nations have created debts ranging from nothing to over 50 per cent of their wealth. What seemed to be a large debt before the World War now appears insignificant. There is no doubt, however, that a 50 per cent mortgage on national wealth is too high. This represents a standard in individual mortgages where the foreclosure privilege is held. Since the debt of the United States is only about 7 per cent of the wealth of the country, it may be safely concluded that the obligations of the United States would have to be multiplied five times or more before the danger line is approached.

National Income—Theoretically considered, the taxing power of a sovereign government is the power to tax even to the point of destruction. But in a democratic country like the United States, taxation would stop long before this point is reached. Even the high corporation income and profits taxes of 1920 absorbed only about one-fifth of net income. Politicians are mindful of the electorate and will not trespass too severely for fear of the ballot. As long as the taxing power of the government is employed with reason and justice, it constitutes the sure source of revenues for the payment of public obligations.

TABLE 67—REALIZED INDIVIDUAL INCOME IN 1925

Source	Percentage of Total
Agriculture . . .	11 09
Manufacturing	20 59
Mines, quarries, and oil wells	2 65
Construction	4 22
Banking	1 34
Mercantile	14 64
Government ..	7 48
Transportation . . .	8 22
Unclassified	20 08
Miscellaneous	9 69
All industries . . .	100 00

From W I KING, *The National Income and Its Purchasing Power*, pp 98-99

The ability of a people to liquidate its public obligations, therefore, is measured more by its income than by its wealth. It is out of the income of the people that taxes are paid. Wealth is frequently made the basis of assessment of taxes, but this is because of its concrete character which will not allow escape from the eye of the tax man. As has already been pointed out, wealth is an index to ability to pay taxes because of the function of capital in production. An assessment of wealth, therefore, is a more or less satisfactory index to actual or potential income. The Federal Government has never employed this method of taxation but at the present time obtains most of its revenue from individual and corporate income and profits taxes. Regardless of

the different forms which national taxation has assumed in the past, the amount collected has never absorbed a considerable portion of the national income

The character of the national income is of equal importance with the amount. As was found to be the case with wealth, the national income of the United States rests upon a broad basis. The percentage derived from the different sources for the year 1925 may be taken as representing normal conditions.

Both the amount and character of the national income are reassuring in the case of the United States. It is, in addition, more stable and permanent in character than the income of countries which rests upon a narrower base. The diversity of income in the United States as compared with many other countries constitutes an element of strength in our favor which must not be overlooked.

Revenue System—Next in importance to the character of the national income is the revenue system of the government. The ideal revenue system is one that dovetails closely with the social and economic structure of the country. In early history this structure was comparatively simple. Great differences in wealth that now separate the people into the several classes did not then exist. Down to the War of 1812 the revenues of the government were derived mainly from customs duties. Since everyone was a consumer and differences in wealth were not conspicuous, this kind of tax rested broadly upon the whole people. During and after the War of 1812, customs duties were levied in much greater amounts and were supplemented by excise duties and direct taxes apportioned among the states. There was no important change in the sources of revenue until the eighteen thirties when the sales of public lands for a few years preceding the panic of 1837 were so great that the revenues from this source even overtopped the customs receipts. But the main dependence for many years to come was the customs receipts. With the finances of the Civil War a fundamental change came about. The necessity for enormously increased revenues brought an income tax and a broad system of excise duties on wines, liquors, and almost every conceivable article of consumption. Although the income tax was abandoned a few years after the war, the excise taxes remained. Customs receipts and excise duties were the two great sources of national revenue until the enactment of the income tax in 1909. The entrance of this country into the World War brought heavy income and profits taxes on individuals and corporations.

Receipts from taxes levied on articles of consumption and paid by the general public, including both customs and excise duties in 1920, amounted to approximately \$1,100,000,000, individual income taxes totaled \$1,157,000,000, of which \$165,000,000 was paid by individuals with incomes of \$5,000 or less, and \$992,000,000 by those having

incomes of \$5,000 or more. The taxes, therefore, which rested upon the masses of the people amounted to \$1,265,000,000, the sum of consumption taxes and income taxes paid by those of incomes of \$5,000 or less. Around \$2,000,000,000 was paid by corporations. If to this is added the amount paid by individuals of \$5,000 income or more, the total is approximately \$3,000,000,000. Miscellaneous taxes amounted to \$973,000,000. The figures show that the bulk of the taxes was paid by corporations and the wealthy classes. Never before has the United States Government taxed the wealthier classes and corporations of the country so heavily. No system of taxation can thoroughly support government requirements that is not grounded deeply in the social and economic structure of the country.

Since 1923 the revenue system of the Federal Government has depended more and more upon individual and corporation income taxes. Owing to the high exemptions of the individual income tax, taxes are paid mostly by the well-to-do and rich classes. Revenues by sources for the years 1923 and 1930 show this tendency.

TABLE 68—FEDERAL REVENUES 1923 AND 1930
(000 omitted)

Source	1923	1930
Customs (including tonnage tax)	\$ 561,928	\$ 587,000
Income and profits taxes	1,678,607	2,410,986
Miscellaneous internal revenue	945,865	628,308
Miscellaneous revenues (including Panama Canal)	820,733	551,645
Total	\$4,007,133	\$4,177,939

It is doubtful if such a one-sided system of taxation is the soundest. Certainly it is not the most dependable. One of the characteristics of a good revenue system is its stability and assurance that in all times adjustments may be made to provide adequate funds to balance the budget. A cursory review of the revenue system from the beginning with this in view will be profitable at this point.

As long as the revenues were derived from customs receipts for the most part, they showed great variation in amount, often resulting in embarrassing deficits. The Embargo Act of December, 1807, and the circumstances connected with it, caused a drop in customs receipts from over \$16,000,000 to something more than \$7,000,000, resulting in a deficit of \$2,500,000 in the treasury. Likewise the large receipts from public lands up to 1836, accompanied by a decline in revenue duties, caused large surpluses in the treasury, enabling the public debt to be completely paid off. But the sudden cessation of sales of land that

same with the panic of 1837 and circumstances connected with international trade turned the large surpluses into almost equally large deficits. Again, after the panic of 1857 when the main revenues were from customs receipts, previous comfortable surpluses were abruptly turned into enormous deficits which were the underlying cause of the collapse of public credit just preceding the Civil War. Although in 1873 the revenues rested fundamentally on both customs and excise duties, the panic of that year so reduced the customs receipts that surpluses in the revenues of almost \$100,000,000 were almost completely wiped out in the year following and did not gain their former position until after 1880. The panic of 1893 caused an unprecedented drop in the customs receipts and resulted in a deficit of over \$60,000,000 in 1894. The excise duties were the steadying influence in the system, without which a much worse situation would have occurred.

The stability of the revenue system under present conditions leaves much to be desired. Customs receipts dropped from \$587,000,000 in the fiscal year 1930 to \$378,000,000 in 1931, a loss of 35 per cent, income taxes dropped from \$2,410,000,000 to \$1,860,000,000, a loss of 23 per cent, internal and miscellaneous revenues decreased only from \$1,179,000,000 to \$1,078,000,000, or 9 per cent. Final returns for 1932 will make a far worse showing for customs revenue and income taxes, the budgetary deficit for this year threatens to run as high as \$2,500,000,000, out of normal taxes of about \$4,000,000,000. The steadying effect of excise taxes may again be specially observed.

The excessive deficits of 1931 and 1932 caused some apprehension on the part of the public and this was doubtless an important factor in prolonging the recent depression. It went far toward explaining the continued decline in security values and loss of confidence in the first half of 1932. This situation was even aggravated by the temporizing attitude of Congress in the face of financial peril.

Federal Expenditures.—Federal expenditures since 1927 have materially altered the character of the budget. The leading items of expenditure for 1927 and estimated amounts for 1932 are given in Table 69.

The increase in the leading items of expenditures in the 5 years 1927–1932 amounted to \$759,588,000, or 43 per cent. Such a rate of increase is alarming indeed and was doubtless a part of the general extravagance of the times. Nevertheless, experience has taught that once general expenditures increase, they tend to become permanent. The opposition of Congress to any material reductions in 1932 was plainly evident. It should especially be pointed out that the expenditures for the debt service now constitute upward of one-fourth of all federal expenditures and that expenditures for pensions and veterans' administration amount to another 20 per cent. One cannot fail to note the rapid increase in expenditures for the Treasury Department (occasioned largely through

TABLE 69—LEADING ITEMS IN GENERAL FEDERAL EXPENDITURES
(000 omitted)

Source	1927	1932 (estimated)
Legislation	\$ 19,678	\$ 32,382
Executive	612	433
State Department	16,497	16,564
Treasury Department	151,560	312,854
War Department	360,808	483,725
Department of Justice	24,819	58,798
Navy Department	318,909	378,913
Interior Department	72,150	78,344
Department of Agriculture	158,287	333,547
Department of Commerce	30,939	54,673
Department of Labor	9,921	14,129
Veterans' administration and pensions	622,026	784,442
Total	\$1,784,206	\$2,543,794
Interest and retirement of debt	1,306,573	1,016,946
Total	\$3,090,779	\$3,560,740

prohibition enforcement), the Department of Agriculture, as well as the War and Navy Departments

Market, Price, and Yield—In 1870 the yield to maturity on government bonds was something like 4 25 per cent. But the gradual retirement of the government debt during the next 20 years, together with the demand for bonds for coverage of national bank note circulation, gradually reduced this yield. In 1890 the Government 4s of 1907 sold at 125, the yield on these bonds continued to decline to 1 98 per cent in 1901. The Consol 2s and Panama 2s (two issues) are the only circulation bonds outstanding at the present time. They have an additional market for purposes of covering government deposits in banks and are also eligible for investment of trust funds and savings banks under various state laws. These bonds have continued to sell to yield under 2 per cent. The Conversion 3s were issued to Federal Reserve Banks in exchange for the 2s and are still partially held by these banks as coverage for bank notes. Their yield is lower than that of the Panama 3s. All of these bonds are tax-free.

Liberty bonds were originally floated at par at interest rates ranging from 3½ per cent on the first issue to 4¼ per cent on the fourth. In fixing the rates, the Treasury Department frankly placed the interest rates lower than the market for other investments would warrant. It did so depending upon the patriotism of the people to take them at exceptionally low yields with the consequent reduction in the cost of the war. The success of the Treasury Department in thus floating bonds

was unexampled, subscriptions greatly exceeding the amount of the bonds to be sold. As the war progressed and money became scarcer, the interest rates on the successive issues were raised and the bonds previously issued were in turn made convertible into subsequent issues bearing higher rates of interest. The conversion privileges, of course, exercised a determining influence on the price of convertible issues which approximated that of the issue into which they were convertible.

After the fervor of the war subsided and the country began settling down to sober readjustment, the prices of Liberty bonds were accordingly affected. The artificially low interest rate when compared with the yield on good corporation bonds brought about a marked recession in quotations. The lowest prices ever quoted on Liberty bonds together with the dates are as follows:

TABLE 70—LOWEST PRICES EVER QUOTED ON LIBERTY BONDS

Issue	Price	Date	Price, June 29, 1923
First 3½s	86 30	July 9, 1921	100½½₂
First 4s	83 00	May 19, 1920	97½½₂
First 4½s	84 00	May 18, 1920	98½½₂
Second 4s	81 70	May 20, 1920	97½½₂
Second 4½s	82 00	May 20, 1920	98½½₂
Third 4½s	86 00	Dec 21, 1920	98½½₂
Fourth 4½s	82 54	May 20, 1920	98½½₂

These low prices did not, as some claimed, result from lack of credit of the government but were the result of economic and legal forces. Perhaps the largest factor in the situation was the wide distribution of the bonds when the war closed. There were some 20,000,000 holders at that time. This number has since been reduced so that at the present time there are probably not more than 4,000,000 owners. Many of these bonds and Victory notes were bought on the instalment plan at a rate of interest exactly offset by the rate on the bonds themselves. But when loans were renewed they were made at the prevailing bank rates, which were from 1 to 3 per cent or more higher than the bond rates. The result was that rather than pay the difference many people sold. Doubtless the disposition to hold bonds that returned a rate of interest lower than was accustomed to be received by investors, together with the progressive decline in the prices after the war, led hundreds of thousands of people to dispose of their holdings. Small purchasers undoubtedly felt the need of their funds for other purposes, while the speculator exchanged his bonds for promotion stocks that promised anywhere from 100 to 1,000 per cent return on the investment in a short time.

Most of the Liberty and Treasury bonds at the present time are held by banks, insurance companies, corporations, and trust and endowment funds. In 1931 banks and insurance companies alone held between \$7,000,000,000 and \$8,000,000,000 of United States Government securities. Many are held also by individuals desiring to escape heavy federal and state taxation.

The prices of government bonds, outside circulation bonds, have undoubtedly been greatly supported by the retirement program of the government and on account of the privilege of turning some of these issues in at face value in payment of federal inheritance taxes.

Differences in yield are accounted for partly by differences in tax features. The First 3½s are totally exempt, except for federal, estate, and inheritance taxes. This issue commands a relatively high price on this account. The size of the issue undoubtedly exerts some influence also on price and yield.

In conclusion it may be said that Liberty bonds as a class return a lower yield than the best railroad bonds and distinctly less than first-class railroad bonds of less seasoned character. With the exception of the First 3½s, they compare favorably in yield with the best municipal bonds but yield materially less than the municipals of any except the largest cities. Their yield is considerably lower than the best public-utility bonds. Liberty bonds will in the future be sought by those looking for tax-exempt issues of undoubted safety and which occasion the least amount of care. They will also be held by banks and corporations where they are virtually tax-free, and by trust funds where safety is the paramount consideration.

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CHAPTER XXXIII

AMERICAN STATE BONDS

When viewed as a whole, the debt record of American states affords a striking contrast to that of the United States Government. While the latter presents an unbroken record of promptness and good faith in the discharge of its obligations, the record of the former is frequently marred by uncertainty, delay, and even repudiation, with corresponding losses to investors. Nevertheless, when reviewed individually most of the states have enviable records in the discharge of their obligations and it would be unfair to judge these in the light of the picture as a whole. Here, as elsewhere, a fair estimate of the credit of each state must be made upon the basis of its own special record. A brief history of American state debts as a whole, with special reference to the errors of certain states, will be helpful in gaining a background for the present situation.

It should first be observed that borrowing by American states in the past has been spasmodic in character. Four different waves stand out in the picture from the revolution down to the present time. These were as follows: (1) the period of the revolution when in the absence of a central government the states contracted debts to prosecute the War for Independence, (2) the period of borrowing for internal improvements, chiefly between 1830 and 1838, (3) the decade beginning with the Civil War, (4) the period following the World War. The intervals between these waves of borrowing were marked by comparative inactivity and actual reduction in the total amount of state debts outstanding.

Revolutionary Debts.—All of the 13 states incurred debts in connection with the War for Independence. Part of these debts was paid by the states themselves. But with the formation of the union in 1789 and the transfer of import duties from the states to federal authority, in order to protect the creditors of the states, it became imperative that the Federal Government assume the state obligations. The per capita debt of the South was less than that of the North but the South consented to Hamilton's scheme for assumption and equal distribution of the burden through a bargain which located the federal capital in territory carved out of Virginia and Maryland. Through the act approved August 4, 1790, the Federal Government thus assumed \$18,271,788 of state obligations, 60 per cent of which was incurred by the three states of South Carolina, Massachusetts, and Virginia.¹ "Each subscriber received three certificates, one for a sum equal to four-ninths of the subscribed sum with interest at 6 per cent, another for two-ninths of the

¹ D. R. DEWEY, *Financial History of the United States*, pp. 92-94.

subscribed sum, to bear interest at 6 per cent after 1800, and the third certificate for the remaining three-ninths, bearing an interest of 3 per cent."¹ The federal revenues were pledged for the payment of interest, foreign loans being given priority of claim, the proceeds of the sale of western lands were specifically pledged for the discharge of the debt.²

Public Improvements.—Except for small war debts incurred by some of the states to aid in the War of 1812, borrowing by states for 30 years after 1790 was almost non-existent.³ After 1820 public improvements began to occupy the attention of state governments. In the period 1820–1825 the seven states of Alabama, Louisiana, Maryland, New York, Pennsylvania, South Carolina, and Virginia incurred debts to the extent of \$12,790,728.⁴ During the next 5 years Maryland, New York, Ohio, Pennsylvania, South Carolina, and Virginia incurred debts amounting to \$13,679,689.⁵ The debts incurred during the decade of the eighteen hundred twenties were contracted by the older and more populous states, whose resources were “adequate to their undertaking.”⁶ But after 1830 the newer and less populous states engaged in borrowing on a large scale. Then it was that state debts began to assume commanding importance, between 1830 and 1835, 12 states issued securities aggregating \$40,012,769. But the situation did not become alarming until after 1835. In the three years 1835–1838, 16 states issued securities totaling \$107,823,808. In the entire period 1820–1838 states contracted debts aggregating \$174,306,994.⁷ The total debts outstanding in 1839 have been officially estimated at \$163,728,390.⁸ Nevertheless, eight states, New Hampshire, Vermont, Rhode Island, Connecticut, New Jersey, Delaware, North Carolina, and Georgia had no debts at this time. Maine and Missouri had incurred only small amounts. A large proportion of all state bonds was sold abroad, chiefly in England. The purposes for which state debts were incurred and their amounts were as follows (after allowing for redemption of some \$4,500,000 bonds by New York)

Canals	...	\$ 60,201,551
Banks	.	52,740,000
Railways		42,871,084
Roads		6,616,868
Miscellaneous		8,474,684

Total	\$170,356,187
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From *Tenth Census*, Vol VII, p 526

¹ *Ibid.*, p 95

² *Ibid.*, p 96.

³ *Tenth Census*, Vol VII, p 523.

⁴ *Idem*

⁵ *Ibid.*, pp 523–529

⁶ *Ibid.*, p 529.

⁷ *Ibid.*, p 523

⁸ *Ibid.*, p 281

The purposes for which state debts were incurred, namely, for public improvements, go far toward explaining the extravagance of this wave of borrowing. This remarkable movement can be understood only in the light of the times. After the War of 1812 America turned its face toward the West. The population west of the Alleghenies was growing "fearfully." It sought a market for its agricultural products in the East, while the East in turn sought transportation for its manufactured goods in the West. The efforts of New York, Pennsylvania, Maryland, and Massachusetts to form connections with the West have been recited in another place. The first successful effort was marked by the opening of the Erie Canal in 1825. The effect of this was electrical. "A vehement desire to construct great public works" arose.¹ The situation became intensified in the eighteen hundred thirties. After the effects of the Napoleonic wars had worn away, Europe entered upon a period of material well-being which gave rise to an unprecedented demand for American manufactured goods and agricultural products. The stimulation of high prices to agricultural production carried enthusiasm to a high pitch. Everywhere conservatism was forgotten. In fact it was an era of great world prosperity. Judge Curtis remarks, "At no other period did the wild spirit of adventure become epidemic over so many countries till it seemed to affect the whole world."²

The great prosperity in America enabled the Federal Government to pay the last instalment of its debt in 1834,³ and in 1827 to distribute its surplus revenues to the extent of \$28,101,644 to the states.⁴ Unfortunately with expanding prosperity there came the dispute over state and federal rights which ended in victory for the former. With the election of Jackson in 1832 the doom of the Second Bank of the United States was forecast. This led to a mushroom growth of unsound state banking, chiefly in the West and South. Between 1830 and 1837 the nominal capital of state banking institutions increased from \$110,000,000 to \$225,000,000.⁵

The bubble of overexpansion and inflation burst with the panic of 1837. The Bank of the United States in Philadelphia and every other bank in the country to the south stopped payment, while the solvency of the Bank of England was also threatened. The panic brought the first severe shock to American public credit and by 1839 Europe entirely closed its markets to American state stocks.⁶ The state of the improvements themselves was set forth by Thomas Benton as follows:

barren banks, which cannot lend, suspended banks, which will not pay, broken banks, which cannot pay, unfinished roads and canals, which are useless,

¹ Words of Judge Curtis, quoted in *Tenth Census*, Vol. VII, p. 525.

² *Idem*.

³ *Ibid*, p. 524

⁴ *Ibid*, p. 529

⁵ *Ibid*, p. 524

⁶ See W. L. RAYMOND, *State and Municipal Bonds*, p. 53

finished ones, which are either bringing their owners in debt or barely paying the expenses of repairs, the cost of management, and interest upon the outlay. This is their condition. Their value at home is shown by the thermometer of the stock market, where they range at all the degrees below par down to the freezing point of zero. In Europe, although backed by the credit of the states, they rate from one-half to three-fourths of their nominal value.¹

First Period of Default 1840-1842.—By 1840 many of the states found themselves in financial difficulties. Some defaulted only on interest payment, while others deliberately repudiated both the interest and principal of their debts. Default on interest payments came in 1840 to Indiana and Florida, in 1841, to Illinois, Michigan, Mississippi, and Arkansas; and in 1842, to Pennsylvania and Maryland.² Default proved temporary in most of these cases. Indiana, Illinois, Maryland, and Pennsylvania within a few years made arrangements by which overdue interest payments were settled and current payments renewed. The debts of these states proved to be too burdensome for the times.

The debt of Pennsylvania amounted to \$37,319,395 in 1842. With the panic of 1837 work on canals and railroads in process of construction ceased entirely and the properties passed largely into private hands, the investment in many cases proving a total loss. The abandonment of the state tax on general property, together with the issue of relief notes as currency after the panic, made it impossible for Pennsylvania to pay interest on the debt in cash. The state resumed interest payment in 1845, however, and later sold some of its railroads and canals, applying the proceeds to the payment of the principal of the debt. Creditors were finally paid in full for the obligations which they held.

The weakness of the situation in Maryland was similar to that in Pennsylvania. The state depended upon the revenues from the railroads and canals which were undertaken for the funds with which to pay the interest on the debt incurred in their construction. The state really had no tax system whatever. Taxes were soon levied, nevertheless, and interest at the full rate resumed in 1848. Indiana had floated bonds for the Wabash and Erie canals and the State Bank of Indiana. The pioneer character of the state made it impossible to collect sufficient taxes to pay the interest after 1840. Not until 1846 were arrangements made for settlement in full of all back interest and resumption of current payments. Illinois issued bonds in aid of railroads, the Illinois and Michigan Canal, and for bank stock. Great losses resulted to the state from the failure of banks whose stock it held. The total debt amounted to \$14,440,381 in 1844, and no money except the state's own depreciated

¹ Tenth Census, Vol. VII, p. 527.

² The best brief account of repudiation in the separate states is contained in William L. Raymond's work *American and Foreign Investment Bonds*, Chap. III.

paper was available for interest payments. Within a few years, payments were resumed, the revenue being derived from the completed canal and from state taxes. Interest on the bonds of all of the states mentioned in this paragraph was paid in full.

The case of Michigan is entirely different. Bonds for railroads and canals were sold on the instalment plan through agencies which were later unable to make payment in full. The bonds finally came into the possession of European banks which had accepted them as fully paid, as security for loans from American financial houses. The state refused to settle for the unpaid portion of the bonds but made full payment of interest and principal for that portion for which it had received payment.

The debt of Florida arose through the guarantee of certain bank bonds and by direct bond issues in favor of other banks before the time of statehood. The banks all failed and the legislature repudiated the bonds. When the territory was admitted as a state, the constitution forbade settlement for the territorial debt. This is the first clear case of repudiation.

Mississippi also raised money in aid of banks which followed the usual course of miserable failure. In 1842 the greater portion of the bonds issued for this purpose was repudiated on the ground of illegality and fraud. Some, however, were repudiated without the show of illegality or invalidity. The highest state court had previously declared the bonds valid but to no purpose. Repudiation was made a political issue in Mississippi and the people approved it upon several different occasions. In 1876 the constitution of the state was amended and all of the bonds in question were repudiated. The case of Mississippi is usually cited as one of deliberate and inexcusable repudiation in the face of known ability to pay.

The case of Arkansas is similar to that just cited. The legislature refused to make provision for the collection of taxes to pay interest on its bonds which accordingly was defaulted. Finally in 1869 the legislature refunded a portion of the bonds, no good reason was given for failure to meet interest charges on bonds which had been issued in aid of banking institutions. Although the amount was not great and the state was amply able to pay the interest, the legislature refused to levy a tax for the purpose. The interest remained unpaid until 1869, when a portion of the bonds was refunded.

In passing judgment on this period, one must consider the character of the times. One may observe with Judge Curtis that "rashness was epidemic" and that creditors were quite as much to blame as debtors, foreign lenders, too, were eager to embrace the promise of exceptional returns on their funds. Moreover, in the entire process of borrowing and spending everything was open and public. Nothing was kept secret. Approval of the course taken by state authorities was universal.

The Period 1843-1860.—By 1843 the total debts of the states and territories aggregated \$206,578,583 with annual interest amounting to \$10,328,929 ¹ An effort was made for assumption of state debts by the Federal Government but in the end the states were left to extricate themselves from their financial difficulties as best they could

The first period of default, from July, 1840, to August, 1842, was followed by a decade of inactivity in state borrowing By 1853 the amount was reduced to \$192,527,913 but again increased to \$257,406,940 in 1860 ² With the exception of Massachusetts, the New England states were practically free from debt.

A second period of default and repudiation came between 1848 and 1860 Minnesota had aided the construction of railroads by issuing state bonds in exchange for first-mortgage bonds of certain railroads which afterwards became insolvent By constitutional amendment authorized by the people in 1860, it was provided that neither the principal nor the interest on this debt was to be paid without sanction of popular vote The excuse was fraud Not until 1881, after constant political agitation, was provision for settlement made for both principal and interest The Supreme Court of the state declared the amendment unconstitutional and the legislature agreed either to settle for the bonds on a 50 per cent basis or to exchange them for new ones bearing 5 instead of 7 per cent on a dollar-for-dollar basis The debt was small and the state amply able to pay Such popular repudiation, therefore, can hardly be justified

In 1848, Texas defaulted on its state debt It claimed that face value was not received in return for the bonds issued and proceeded to scale the obligations down to less than one-half of their nominal value According to agreement at the time, the state was admitted to the union The customs had been mortgaged to secure part of the debt in the days of the Republic, the Government of the United States finally, in 1855, appropriated \$7,750,000 to clear its title to the customs receipts This action was necessary because Texas was unwilling to pay the debt, which amounted to repudiation California defaulted in 1854 on its debt incurred for current expenses, which the Supreme Court declared void because it exceeded the provisions of the constitution The legislature, however, in 1857 promptly remedied the illegality and made satisfactory settlement The case has never been considered a serious reflection upon California's credit

The Civil War and After.—In the decade following 1860 state debts increased to \$352,866,698 It may be observed that the middle and western states decreased their indebtedness, while the South showed a

¹ *Report of the William Cost Johnson Committee*; quoted in *Tenth Census*, Vol VII, pp 527-528

² *Tenth Census*, Vol VII, p. 281.

very large increase For the first time since the American Revolution, New England incurred large debts, chiefly occasioned by the Civil War

This period saw default and repudiation for the third time but involved only southern states The causes were similar to those of the first period, excessive credit was extended to railroad and banking enterprises The debts incurred by the southern states in aid of the rebellion are not here considered, since they were outlawed by the Fourteenth Amendment to the Constitution of the United States The South found itself weakened by the Civil War and default soon occurred in several states The southern, like the northern states, had contracted debts before the war and for much the same purposes, in fact they were more industrious in issuing bonds in aid of railroads, banks, and other projects than the northern states These debts were mostly defaulted during the war The experience was the same as in the North, where revenues expected from these undertakings failed to materialize and the enterprises became insolvent The carpet-bag governments forced upon the southern states, after the war, greatly extended the *ante bellum* state debts through extravagance, incompetence, and dishonesty Misappropriations are said to have amounted to about \$20,000,000, for which the "black" republican governors and legislatures were responsible

Virginia's debt was an *ante bellum* legacy and with accrued interest amounted to over \$47,000,000 in 1871. Although fraud was not claimed in the construction of improvements in Virginia, it was claimed that the war had so reduced the resources of the state that it was too poor to meet its obligations Intermittent payments and defaults and readjustments occurred, which in reality were partial repudiation The panic of 1873 rendered the matter entirely hopeless In 1882 the radical element in politics got into control and passed the law known as the "coupon-killer," which refused coupons for taxes as had been permitted for many years previous The Riddleberger Act scaled the debt from 20 to 47 per cent, which was partial repudiation During the following decade agreements were entered into with the bondholders for final adjustment, which again amounted to partial repudiation Virginia's record is not an enviable one

The case of West Virginia is peculiar The state agreed to assume its "equitable portion" of Virginia's debt at the time of separation, provision for which was made in its constitution of 1863 But the interest was never paid The long dispute as to the exact amount that should be assumed was finally terminated by action of the Supreme Court of the United States, and only recently has West Virginia assumed any responsibility in the matter The amount finally decided upon was much smaller than what Virginia considered West Virginia's portion of the debt It has since been paid

North Carolina also accumulated a large debt which was placed at \$41,846,930 in 1876. This debt has back of it the story of incompetence, waste, and fraud to an unusual extent. Frequent default, scaling, and partial repudiation were the results. South Carolina's debt in part reaches as far back as 1794. The state assisted railroads and banking schemes and was subjected to unusual provocation by the carpet-bag government imposed upon it after the Civil War. State funds were largely wasted by this *régime*. Invalidity and illegality were charged by the Supreme Court of the state on part of the debt. Frequent default and partial repudiation tell the story of this state laboring under the shadow of fraud and the iron hand of the "black" *régime*.

Georgia, under carpet-bag government, voted bonds in aid of railroads and many other different kinds of public improvements, but the funds raised for this purpose were largely wasted. Upon the charge of fraud and irregularity, the legislature repudiated a large portion of the total debt. Alabama's debt goes back as far as 1823, when bonds in aid of banks and other enterprises were issued. Interest was defaulted in 1861. After the war certain railroad bonds were guaranteed by the state, while others were issued directly by the state. In both cases subsequent default took place. This state went through the usual process of scaling and repudiation already noticed in connection with other states.

Tennessee also assisted banks early in the thirties and subsequently railroads and other enterprises. The enterprises failed and default took place during and after the Civil War. In 1883 the legislature acted in favor of repudiation of interest and scaling of the debt.

Louisiana issued large amounts of bonds after the Civil War for levees, railroads, and canals. In 1872 the total debt was \$41,733,752. Invalidity and fraud were subsequently charged and repudiation followed. Refunding was attempted here as elsewhere with the usual result of repeated default on the funded portion.

Missouri, in the fifties, also loaned its credit in guaranteeing bonds of railroads. The roads failed during the war and the state defaulted. The legislature enacted tax laws which went far towards making up the overdue interest. The state never went so far as repudiation. Raymond, in his *American and Foreign Investment Bonds*, says: "The debt history of Missouri is a troubled but honorable one."

A large portion of the state debts, even in the third period of repudiation, was held abroad. American state credit suffered almost irretrievably. The South suffered more than the North because repudiation there was more flagrant. In the North the process usually stopped at default, but in the South repudiation by public authority or by popular approval was common. No public meetings were ever held to protest against repudiation. On the contrary, candidates for Congress were elected on repudiation platforms. Federal patronage was also given

these members of Congress by the President of the United States. Those active in repudiation were supported by senators of non-repudiating states. Repudiation was a disease affecting a full generation and more of American life, and its roots were most deeply sunk in the South. To the foreigner no amount of explanation could restore American state credit to its former high position.

Glancing backward over the three periods of default, one may observe that the credit of the states suffered when the debts became burdensome or when the purpose was not public in the strict sense of the word. In his summary of observations Raymond concludes that the states which showed bad faith were Alabama, Arkansas, Florida, Georgia, Louisiana, Minnesota, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia—11 southern states, and 1 northern state. This was largely the result of demoralization in the South from the slavery question and the Civil War.¹ In 1921 eight southern states were still in default of debts amounting to \$60,000,000, on which interest to the extent of \$180,000,000 had accumulated.²

It should be added that the outcome of the speculative enterprises which were responsible for the creation of the debts, in many cases, had also a determining influence on repudiation. Had these proved immediately profitable as many of them subsequently did, there is little reason to believe that default would have occurred, especially before the Civil War. State ventures, like individual speculations of the period, were ill-conceived in most cases. The impetus of the development of new territory so inflamed the imagination of the people that nothing seemed impossible. Transportation, the key to the unlocking of new and opulent territory, pressed irresistibly for solution and the course followed was the pledging of state credit where private credit would not suffice. In their zeal for development the men of those days overshot the mark, as viewed from the standpoint of today. It seems unlikely that the circumstances of those times will ever return. In a sense this constitutes a closed chapter in state finances.

In contrast with these states stand the records of Massachusetts, New York, and other states which, with the exception of California previously noted, have never defaulted upon interest or principal. Some of these states are entirely free from legal restrictions in the creation of debts and have shown remarkable wisdom in the management of their finances. State debts have generally been small in the United States. The recent tendency to borrow heavily on highways is, in reality, a mark of wisdom, since taxes sufficient to meet these expenditures would cause an unnecessarily heavy burden. But if borrowing according to the serial bond method is employed, indebtedness for this purpose need not cause alarm.

¹ W. L. RAYMOND, *State and Municipal Bonds*, p. 59.

² *Idem*

The experiences of the states with borrowing during the 50 years prior to 1870 taught them lessons which they were slow to unlearn. In fact state debts decreased from 1870 to 1895 to less than \$200,000,000 and increased from then only moderately until the time of the World War. In 1913 they stood at only \$345,942,305 (after deduction of sinking funds), which was less than the figure for 1870.

The Period 1914-1932—State debts have increased very rapidly since 1914, more especially, however, in the period following the World War. In 1919 total debts of all the states (less sinking funds) amounted to \$546,946,000, in 1929 they stood at \$1,856,306. The per capita indebtedness rose in the decade from \$5.20 to \$15.38.¹

The recent revival of state borrowing is due to a number of factors. It was in a measure due to the war itself, which occasioned borrowing for soldiers' bonuses. But most of the increase has been due to other causes. Soon after the war South Dakota embarked upon a rural credit scheme and issued direct obligations of the state to provide the funds. These are ultimately secured by mortgages on the farms receiving benefits of the

TABLE 71—NET INDEBTEDNESS OF STATES BY DIVISIONS OF THE UNITED STATES, 1929

Division	Total debt	Per capita debt
New England	\$ 117,387,000	\$14.51
Middle Atlantic	405,722,000	15.75
East North Central	285,512,000	11.47
West North Central	141,236,000	10.69
South Atlantic	371,838,000	24.62
East South Central	166,842,000	16.46
West South Central	142,311,000	11.88
Mountain	44,641,000	12.20
Pacific	180,817,000	22.97
Total	\$1,856,306,000	\$15.38

From *Statistical Abstract*, 1931, p. 226

loans. In North Dakota bonds in large amounts were issued to enable the state to enter into socialistic conduct of mills, elevators, banks, real estate, and so forth. Even Massachusetts guaranteed for 10 years the dividends on the stock of the Boston Elevated Railway Company and the principal of \$4,000,000 bonds of the Eastern Massachusetts Street Railway Company. But the main purpose of state debts in the recent period has been for highways. Debts for highways amounted to 54.4 per cent of the total state indebtedness in 1929. Soldiers' and sailors' relief and bonuses accounted for 11.2 per cent, while public utilities showed 14.1 per cent. These three items together accounted for 79.7 per cent of all state debt.

¹ *Statistical Abstract of the United States*, 1931, p. 229

edness Debts for highways loomed large in all sections of the country except New England and the West North Central states Debts incurred for relief of war veterans were especially large in the North Central and Pacific states, those incurred for public utilities were largest in New England (37.1 per cent of the total), West North Central (50.3 per cent of the total), and in the Pacific states (21.9 per cent of the total).¹

The net and per capita indebtedness of the various sections of the United States are set forth in the table shown on page 638

The Wealth of the States.—Just as in the case of the national debt, the burden of state debts may be measured by the relation of the debt to wealth, since this is an indication of the producing power of the state Statistics of state wealth may be obtained from decennial reports of the Bureau of the Census and from figures of assessed valuation The latter have the advantage of being more nearly current, while the former are more accurate as of the census date.

Assessment figures must be used with caution, since they range all the way from 15 per cent of true value in Iowa to approximately 100 per cent in a number of the states. The laws almost universally require assessment at market or true value, but the interpretation of this is left to local assessors who generally scale values arbitrarily The service of the state boards of equalization and other similar authorities is mostly in the interest of equality, with the result that assessments are as likely to be lowered as raised On account of the lack of uniformity in assessment, it is difficult to make use of comparative statistics Furthermore, it is to be remembered that the great bulk of intangible property escapes the eye of the assessor, rendering personal property valuation of little or no significance The figures for real-estate assessments are much more reliable and cover all kinds of taxable property within the state, including railroads, public utilities, and other corporate property

The character of the wealth is quite as important as the amount. One-industry states indicate instability of annual income of the people and of revenue from taxation, while states of diversified property indicate relative strength and stability The amount and character of the wealth of selected states are shown in Table 72

These figures show that real estate is the backbone of the wealth of most of the states In South Dakota and Iowa it constitutes approximately 70 per cent of all the property of these states. Moreover, it is constituted mostly of farm property with its tendency to instability of income About 47 per cent of the wealth of Rhode Island is in real estate but it is largely residential and business property, the former having no productive power whatever. Evidently this state must lean heavily upon other classes of property, chiefly manufacturing machinery

¹ National Industrial Conference Board, *Cost of Government in the United States, 1929-1930*, p. 57

and tools, since "other" tangible property is likely to be largely personal and non-productive. On the other hand, the states of New York, Pennsylvania, Massachusetts, and Missouri show a high degree of diversity of property. These states have large commercial and financial

TABLE 72—TANGIBLE WEALTH OF CERTAIN STATES, 1922
(In millions)

State	Real estate and implements	Live-stock	Farm implements and machinery	Manufacturing machinery, tools, and implements	Railroads and their equipment	Motor vehicles	Street, railways, shipping, water-works, etc	All others	Total
California	\$ 8,360	\$191	\$102	\$ 438	\$ 710	\$317	\$1,057	\$3,852	\$15,032
Georgia	1,954	101	39	159	319	53	169	1,098	8,897
Iowa	7,173	466	228	143	583	183	246	1,454	10,512
Massachusetts	7,156	35	13	1,046	268	146	530	3,784	12,181
Missouri	5,796	248	98	233	612	145	404	2,342	9,982
New York	20,757	225	143	2,133	1,479	384	2,594	9,386	37,085
Pennsylvania	14,014	203	127	2,193	1,902	308	1,268	7,915	28,834
Rhode Island	912	5	1	211	34	25	65	668	1,925
South Dakota	2,072	152	85	11	229	46	37	291	2,926
Texas	5,962	327	105	208	640	189	385	2,030	9,551

From Statistical Abstract of the United States, 1931, pp 296-297

interests and the first three in addition have material wealth in farms and mines. New York is the gateway to the United States and, in a sense, the basis of its property values is as broad as the nation itself. Where a high percentage of a state's wealth is accounted for by oil or other mineral resources subject to sudden exhaustion, state debts, unless moderate in amount, rest upon an unsafe basis.

In spite of the tendency to rapid increase in state debts over the past decade, the burden of these debts is not great. When considered as a whole, the net debt of all the states is still within 1 per cent of the property valuation, after adjustment has been made to the 1913 price level. On the other hand, the debt of New York State at the present time is about 7 per cent of the 1922 property valuation. North Carolina had the highest per capita debt in 1929, amounting to \$56.55; Arkansas showed \$54.63, and West Virginia, \$38.04. Fourteen other states had per capita debts in the same year in excess of \$20. The states of Nebraska and Wisconsin had practically no debts, while Connecticut, Ohio, Indiana, Oklahoma, and Texas had only small amounts.

State Revenue.—Formerly it was the custom to depend mostly upon the general property tax for state governments. As recently as 1922, 41 per cent of all state taxes was collected from this source, but in 1929 only 22 per cent was thus collected. General and special property taxes together accounted for one-half of the revenues in 1922 but dropped to

28.5 per cent in 1929. This decrease, however, is due almost altogether to the increase in other forms of taxes, especially the gasoline and motor vehicle license taxes, rather than an absolute reduction in revenues. In 1929 New Jersey collected 50 per cent of its revenues from the general property tax, and Michigan 40 per cent. On the other hand, three states collected no regular general property taxes. Twelve states now collect a state income tax and in some states this amounts to a substantial proportion of the total revenues. At the present time all states collect a gasoline tax and motor license tax. Revenues from these two sources were about equal in 1929 for the country as a whole but they varied widely among the several states.

TABLE 73—SOURCES OF STATE TAX REVENUE, FISCAL YEAR 1929
(In millions)

State	General property taxes	Special property taxes	Inheritance taxes	Income taxes	Other special taxes	Gasoline taxes	Motor vehicle licenses	Business licenses	Miscellaneous	Total
United States	\$350.2	\$108.8	\$148.5	\$74.5	\$69.1	\$282.5	\$287.0	\$272.8	\$18.0	\$1,611.9
California	9.1	13.1				20.5	6.8	42.8	1.0	93.7
Georgia	6.7		0.6		0.4	7.6	4.5	2.7	0.1	23.3
Illinois	17.0	2.7	9.8		1.1	13.6 ¹	16.4	10.6	0.4	58.2
Massachusetts	8.5	9.4	12.0	0.6	1.5	7.4	6.5	3.8	0.2	50.2
Minnesota	13.9		1.5		0.1	3.6	10.7	15.1	0.5	45.8
Nebraska	7.7				0.1	4.7	1.3	0.7	0.2	14.9
New York	14.5	10.9	47.2	41.7	46.3		29.4	48.9	0.8	240.2
North Carolina		0.9	0.9	7.0	0.1	10.7	6.8	4.2	0.3	31.8
Ohio	3.7	5.7	2.9		1.5	19.9	0.6	17.5	0.5	58.0
Pennsylvania		38.1	17.5		2.6	19.9	27.7	16.0	2.0	124.2

From National Industrial Conference Board, *The Cost of Government in the United States, 1929-1930*, pp. 110-111.

¹ 1928 taxes.

The revenue systems of selected states are presented in Table 73. In this table may be observed the widely different practices in raising state revenues. Outside the gasoline and motor vehicle license taxes which may be looked upon as special road taxes, some states depend almost entirely upon general property taxes. This is the case with Nebraska and Georgia, as well as with other states not appearing in the table. Other states depend to a large extent upon business license taxes, as in the case of Minnesota and California. Special attention is directed to the states of North Carolina, New York, Ohio, and Massachusetts, which have developed rather well-rounded systems of revenue. Needless to add, the broader the base of taxation, the greater stability will the revenues have.

State Expenditures.—State expenditures, along with other government expenditures, have shown a tendency to increase rapidly. Payments for cost of government alone amounted to only \$399,714,000 in 1915, in 1922 they rose to \$962,275,000, and to \$1,402,010,000 in 1929.

The per capita expenditures rose from \$4 06 in 1915 to \$8 89 in 1922, and to \$11 62 in 1929

TABLE 74—NET STATE EXPENDITURES, FISCAL YEAR 1929

Source	Amount, millions	Per cent
General government	\$ 126 7	6 44
Protection	175 1	8 91
Education	559 7	28 46
Highways	752 1	38 24
Economic development	76 2	3 88
Social welfare	254 7	12 95
Miscellaneous	7 3	0 37
Public utilities	14 7	0 75
Total	\$1,966 5	100 00

From National Industrial Conference Board, *The Cost of Government in the United States, 1929-1930*, pp 22-25

The functional distribution of state expenditures for 1929 is given in Table 74. Note that highways account for 38.24 per cent of all expenditures. Expenditures on highways by states are met largely out of gasoline and motor vehicle license taxes and are among the most economical of all state expenditures. They, therefore, may be said to pay their way both directly and indirectly and should give no special occasion for alarm. The main caution here lies in inferior construction in certain states and too long maturity in the bonds issued. Highway bonds, like bonds issued on productive property, should not extend beyond the life of the property itself. On the other hand, no tax is more just or certain than gasoline and motor vehicle license taxes. Expenditures for education, the second largest item in the list, are undoubtedly above criticism where economy is exercised. The third largest item, social welfare, assumes a larger and larger importance in some state budgets. Massachusetts, for instance, spends 38.12 per cent of all its state expenditures for this purpose, New York 22.24 per cent, Rhode Island and Pennsylvania over 20 per cent. Total revenue receipts for cost of government in 1929 exceeded expenditures by 46 per cent, a result which shows great strength in state finances. It appears that no state failed to balance its budget in 1929.

Contractual Features.—State obligations are simple unsecured promises to pay, issued for public purposes. While these are typically direct obligations, in times past they have been only contingent as in the case where the state would guarantee the bonds of railroads, canal companies, or other private enterprises. They have in some cases been strengthened by the ownership of bank stocks, railroad mortgages, or other private securities.

The usual method of paying interest and principal of state obligations is out of taxes or other public revenues, but occasionally out of public property itself. In the American constitutional system the state possesses a sovereignty of its own and this carries with it the taxing power. In the exercise of this power the state may levy taxes as it sees fit to carry out the public purpose. To insure the payment of taxes it may take title to private property if taxes remain unpaid when due, or it may take away from corporations their franchises, thereby depriving them of the right to continue their business. Taxes are by statute a first lien on real estate or personal property.

State Sovereignty.—The original 13 colonies that preceded the 13 states developed independent forms of governments of their own, subject only to restrictions of the mother country. A strong central government was first created by the Constitution of 1789. This was accomplished only by a surrender of certain powers of the states. The Tenth Amendment adopted in 1790 provided that powers "not delegated to the United States by the Constitution, nor prohibited by it to the states, are reserved to the states respectively, or to the people." The states thus retained their original sovereignty, while the Federal Government acquired only delegated powers.

The sovereign character of the states carried with it the power over debts. No legal method exists of compelling a sovereign authority to pay its debts against its will. The Eleventh Amendment to the Constitution adopted in 1796 provided that no state can be sued without its own consent except by another state.¹ Individual holders of obligations of states are therefore entirely dependent upon the good faith of the states in the fulfillment of their contracts.

Two forces, the decisions of Chief Justice Marshall and the Civil War, went far toward establishing the supremacy of the Federal Government over the states. The states, however, retain their constitutions, which are the successors of much earlier colonial charters. The constitution is the organic law as distinguished from legislative acts and is the peculiar contribution of America to democratic government. It is the backbone of state governments.

Certain states holding defaulted bonds of other states brought suit against the latter to compel payment under the federal Constitution, especially the Eleventh Amendment.² Verdicts have been obtained against defaulting states but no effort at compelling states to pay has been attempted. In the case of *Virginia v. West Virginia*³ in the settlement of the controversy over West Virginia's share in the debts that existed prior to

¹ *New Jersey v. New York*, 5 Peters 284 (1831).

² *New Hampshire v. State of Louisiana and New York v. State of Louisiana*, 108 U S 76; *South Dakota v. North Carolina*, 192 U S 286 (1904).

³ 246 U S 565 (1918). West Virginia has since settled its debt.

division, the Supreme Court held that both the court and Congress had power to enforce a judgment against a state and that the reserved powers of the state are necessarily subordinate to the exercise of federal power. But the court postponed action, preferring to allow West Virginia time to move of its own accord.

Restrictions on State Debts.—Many states have chosen to restrict through their constitutions, or otherwise, their borrowing power. This is, for the most part, a legacy of the bitter experience with state debts in the past. Popular disapproval of state debts has been widespread ever since repudiation took place. Although this tendency is now relaxing, there still exist many restrictions on state borrowing. Only four states, Massachusetts, Connecticut, Vermont, and New Hampshire, have no constitutional restrictions whatever. Where restrictions exist, the power to borrow in unlimited amounts for the purpose of repelling invasion, suppressing insurrection, or defending the state in war is generally specified. Floating debts for the purpose of meeting deficiencies in current expenses are also generally authorized. The most common and important provisions found in state constitutions permit debts to be contracted for special purposes through special legislative enactment. Usually, also, provision for taxation to take care of the debts and submission of the proposition to the people for approval are required. In most states public credit cannot be loaned to private enterprises, whether undertaken by individuals or corporations. Provision is also usually made for refunding existing debts. Sometimes provisions are found limiting the amount of the debt on the basis of an absolute figure, or a certain proportion of the assessed valuation of the property within the state. The duration of the bonds is also limited in some cases. The tendency here is to lengthen the time which they run. It ranges from a few years in some states to indefinite maturity in Kansas and South Dakota.

The general effect of these various provisions is to place limits so as to prevent the amount of state debts from accumulating beyond control. They must be looked upon, for the most part, as desirable, especially in the newer states which are without experience. Purely from the standpoint of the contractual relations between the state and the investor, the covenants possess features of greater strength than was found in the case of national obligations where no legal restrictions whatever existed. The provision requiring submission of specific propositions to the electorate is susceptible of great abuse. In proportion as the former opposition to state indebtedness breaks down, it is to be expected that the state governments will take advantage of this provision for increasing state indebtedness. There is danger that an indiscriminating public will exceed the bounds of reason, although possibly animated by the best of motives. Sentimentalism and sound finance have never gone together;

they are antagonistic to each other, and in the interest of the latter proper safeguards should be provided.

A few states limit the tax rate on property in their constitutions. For instance, Alabama limits the annual levy to 0.65 of 1 per cent; Georgia limits the amount to 5 mills on the dollar; and North Carolina to 5 cents on the \$100 valuation. These measures are doubtless of some value in restraining an extravagant administration. They are not to be approved, however, from the standpoint of debts. A state borrowing money should not restrict its ability to repay by thus tying its hands. These provisions are, therefore, to be looked upon with disfavor by the bondholder.

Sinking Funds.—The principle of the sinking fund has found wide application with respect to state debts. Massachusetts has long accumulated funds in this way with which to cancel her debt. In 1921 this fund amounted to approximately \$50,000,000. It is the general opinion that sinking funds are wasteful because they are liable to misappropriation, abuse, market depreciation, or actual loss from poor or declining credit. The case of Virginia is cited where omission to pay interest on the bonds in the sinking fund took place. Pennsylvania, by legislative authority given by the constitution, may divert the sinking fund for purposes of repelling invasion or suppressing insurrection. Nevertheless, the tendency of writers to depreciate the significance of the sinking fund as applied to public obligations is to be deplored. The great majority of sinking funds have been well managed and have furnished a convenient means of canceling debts. As has already been noticed, the sinking funds of the United States Government have always been a mark of strength. So also has the sinking fund in Massachusetts. Sinking funds are less liable to abuse when accompanied by a provision requiring the investment of the funds in the obligations to which they apply or others outstanding of the same political body. The successful sinking fund requires considerable financial ability in its management; it is likely to be bad in case of small political units where little ability is found among public officials. On the whole, sinking funds constitute an important support to public obligations.

Serial Issues.—On account of the defects of sinking funds, it is now becoming the custom to employ serial bonds instead. Both state and municipal obligations are being issued in this form. This departure is to be looked upon as a decided improvement upon the sinking-fund method of retiring obligations, while at the same time it has the same principle back of it as the sinking fund. Public obligations, if retired at all, must be retired through funds accumulated over a period of years out of taxation, since it is impracticable to levy taxes sufficient in any one year to cancel large loans. If the bonds are arranged so that a certain percentage of them matures each year, taxes may then be levied sufficient

to meet the interest on all obligations remaining outstanding and also to meet the maturing issues. This reduces both interest and principal annually and at the maturity of the last bond the entire debt is canceled. The state of Iowa in 1922 issued serial bonds to the amount of \$22,000,000 with approximately equal annual maturities, the last falling due in 1942. Likewise, the state of Kansas in 1923 issued similar bonds to the amount of \$25,000,000, with \$1,000,000 annual serial maturity, the last series falling due in 1948. These bonds represent advanced methods of financing and were floated through responsible banking houses in many cities.

Floating Debts.—Lastly, constitutions make mention of floating debts. Floating debts are to civil bodies what current liabilities are to corporations and should be incurred with equal discretion. Constitutional provisions in this respect are made to cover anticipated revenues or merely to meet current expenses. Many states have abused this privilege and have floating debts outstanding continuously. Floating debts are frequently necessary on account of some irregularity in collection of revenues or on account of the fact that expenses often have to be met before revenues are due. Public bodies finance themselves in hand-to-mouth fashion, and temporary deficits occur more often than surpluses. Borrowing under these circumstances is unavoidable. The guiding principle which should be followed here is the same as with corporations, namely, that all current obligations should be canceled at least once a year. This would prevent floating debts from assuming the character of permanency as they have done in some instances.

Certification.—As an additional guarantee of the legality and validity of state bonds, a number of American commonwealths have adopted in some form the Canadian provincial practice of certification. The principle of certification is the same no matter what the form may be. Certification takes the form of registering state bonds with a state officer, or board, designated by law or in the constitution. Bonds of these states are not valid unless registered with the designated officer. Some of the states, among which are New Jersey and North Carolina, have required certification in its best form by specifically stating that bonds properly certified may not be contested as to their validity. Other states, such as North Dakota, the pioneer in validation, do not guarantee that the bonds are incontestable but stop with validation. Certification or validation is an additional guarantee to the purchaser of state bonds and is a desirable part of the covenant of the state with its bondholders. In practice, bond issues floated by bond houses are certified by the bond attorney, which has always furnished protection to the bondholder. Bonds floated in this way are better than bonds for which no validation or certification has been given.

Taxation.—The taxability of state obligations is regulated by constitutional and legislative authority. The principle of state sovereignty is maintained with reference to the Federal Government's power to tax state bonds. Since the power to tax is the power to destroy, to admit the right of the Federal Government to tax state obligations would be an infringement upon state sovereignty. To tax state or municipal bonds is to tax a governmental function; it is well established, therefore, that the United States does not possess the power to tax state obligations. The power of a state to tax its own obligations is in constitutional theory unlimited and inherent in each state. If a state chooses to exempt its bonds from taxation it may do so, otherwise they are taxable along with other property. The bonds of a state or of its municipalities are taxable by another state if located within the taxing state or if the owner resides within the jurisdiction of the taxing state.

The taxation of the income from state and municipal bonds is subject to much the same constitutional restriction as the taxation of the bonds themselves. The sixteenth amendment to the federal Constitution provides that "Congress shall have power to lay and collect taxes on incomes from whatever source derived." Whether this renders the income from state and municipal bonds taxable under the federal income tax has never been passed on by the Supreme Court, nor has Congress attempted to take advantage of the provision with reference to state and municipal bonds. It is the general legal opinion that no new powers have been granted to Congress and that income from state and municipal bonds is not taxable under this amendment. The decision in the recent case of *Evans v. Gore*¹ seems to confirm this opinion. Income from state and municipal bonds is taxable when such bonds are owned by citizens of the state of issue. If the state has exempted the bonds from taxation by contract, the income is also exempt, because a tax on the income is a tax on the bonds themselves. If the exemption is not by contract, it may be withdrawn at any time and the bonds or income from these taxed.

The matter stands differently with inheritance, succession, or estate taxes. These are levied not upon the property but upon the right to take the property by will or descent. The character of the property is immaterial. Restrictions upon the right of the Federal Government to tax bonds of states and their municipalities and of the states to levy a tax upon federal obligations do not apply in these cases.

At least five states allow complete exemption from all taxes on state and municipal bonds of their own issue. The movement to exempt these issues from taxation by the state of issue is rapidly spreading through either legislative enactment or judicial decision. Almost one-half of the states exempt practically all state and municipal bonds of their own

¹ 253 U. S. 245

issue at the present time ¹ This enables the states concerned to borrow money more cheaply than otherwise would be the case

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¹ These states are as follows Alabama, Arizona, California, Connecticut, Delaware, Georgia, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, New Jersey, New Mexico, New York, Utah, Washington, Wisconsin, and Wyoming—LAGERQUIST, *Investment Analysis*, p 241, footnote

CHAPTER XXXIV

MUNICIPAL BONDS

The term "municipal bonds" in common use refers to bonds in general issued by minor civil divisions of the state. In the narrower sense the term refers to bonds issued by cities and towns, excluding county bonds. Besides city, town, and county bonds, there are quasi-municipal bonds issued by districts, such as school, park, fire, irrigation, drainage, and sidewalk. No matter by what authority issued, the bonds of all minor civil divisions are payable in a manner very much the same, namely, through the general taxing power. Special assessment bonds are distinguished from ordinary municipal bonds in that special sources of revenue are provided by property benefited by the improvement. They may be issued by any of the minor civil divisions or by districts created especially for the purpose.

History of Municipal Debts.—Municipal debts are of earlier origin perhaps than national debts. The city-state of Venice borrowed money from its citizens as early as the twelfth century. In subsequent loans it secured the debts by pledging revenues on salt and the income of the treasury. Some time later Florence borrowed from the bankers pledging special taxes and revenues.¹ But municipalities, as they exist today in Europe and America, did not borrow until the early part of the nineteenth century, when they began to grow in importance with the development of the industrial revolution.

In the United States, Boston had a net debt of \$100,000 in 1822; by 1840 it had increased to \$1,526,793. In 1841 Cleveland had a net debt of \$20,000.² The first official figures on municipal debts are found in the *William Cost Johnson Report* of 1843, which estimated the total debts of cities at \$27,536,422, omitting Washington which apparently had a debt of \$817,920 in 1841.³ The leading cities of the country as well as many smaller ones were represented, among the 17 cities mentioned were New York, Boston, Philadelphia, Baltimore, Savannah, New Orleans, and Nashville. The total indebtedness was larger than the federal debt but less than one-tenth of the amount of state debts.

Prior to 1864 local borrowing was on a very moderate scale, but in that year the situation changed materially. By 1870 total debts

¹ W. L. RAYMOND, *State and Municipal Bonds*, p. 269.

² *Idem*.

³ Twenty-seventh Congress, Third Session, *House Report* 296, pp. 104-106.

amounted to \$515,810,060, of which \$187,565,540 was incurred by counties and the balance by cities and school districts. By 1880 total debts reached \$848,532,875.¹

Indirectly the cause of increase in municipal indebtedness during this period is to be found in heavy taxation by the Federal Government occasioned by the Civil War. This so increased the burden of taxes that municipalities were compelled to resort to borrowing where taxes had previously sufficed. The direct influence, however, was the craze for railroad building. Viewed from the present standpoint, the vigor with which western and southern municipalities entered the railroad-building program is almost incredible. It is said that over 300 cities, counties, towns, villages, and townships in Illinois alone participated in the movement, in Missouri over 100 took part. So great was the business of floating municipal bonds at this time that many investment houses began to specialize in them exclusively.

During the decade following 1880, the total indebtedness increased but little, the craze for railroad-building and the bad repute into which municipal bonds had fallen restrained new flotations. In 1890, however, owing to the policy of the Federal Government in paying off its debt, municipal indebtedness overtopped federal indebtedness. Since that time down to the World War, municipal indebtedness constantly increased, going far ahead of that of federal and state governments. The increase has been particularly rapid since 1900. But even as late as 1912, the net municipal indebtedness of the United States amounted to only \$3,475,954.

Present Status of Local Debts—Borrowing by local units since the war has been on an unprecedented scale. In the 5-year period 1926-1930 total bond flotations for new indebtedness amounted to \$6,221,000,000. The total outstanding local indebtedness in 1932 was over \$13,000,000,000. Local borrowing proceeded at such a rapid pace that, prior to the unbalancing of the federal budget in 1931, it threatened to overtop the federal debt. The per capita state and local indebtedness increased from \$33.11 in 1913 to \$66.10 in 1922, and to \$110.69 in 1929. Cities accounted for by far the larger percentage of the total in 1929. Cities of 30,000 or more population showed debts of \$8,961,973,215 in 1929, of which \$5,553,973,121 was incurred by cities of 500,000 or larger. The net debt of New York City alone was \$1,877,000,000 at the beginning of 1932. The per capita debt increases with the size of the city. Cities of 30,000 to 50,000 population showed per capita indebtedness of \$78.39 at the end of 1929, while those of 500,000 or more showed \$174.69.²

The purposes of local indebtedness for the 5-year period 1926-1930 are shown in Table 75.

¹ *Tenth Census*, Vol. VII, pp. 284, 290.

² *Financial Statistics of Cities*, 1929, Table 20.

The situation revealed by this table is far from satisfactory. The main items of debt represent public expenditures for non-productive property. Moreover, the funds which must be raised to pay interest and

* TABLE 75 —PURPOSES OF STATE AND LOCAL BONDS ISSUED, 1926-1930

Purpose	Amount	Per cent
General buildings and fire	\$ 407,467,000	5 8
Park and museums	219,701,000	3 1
Schools and school buildings	1,215,804,000	17 4
Roads, streets, bridges	2,015,299,000	28 6
Sewers, drainage	543,359,000	7 7
Water	681,057,000	9 7
Improvements	1,018,087,000	14 5
Rapid transit, ferries, and canals	448,069,000	6 3
Harbor and water frontage	136,448,000	1 9
Other	361,476,000	5 0
Total	\$7,041,767,000	100 0

principal instalments, except in the case of special assessment bonds, are almost wholly raised from general taxation. The picture seems to be one of local extravagance in a period of generally loose finance with final payments shifted to future taxation. Undoubtedly the pace set cannot be maintained without wrecking local finance entirely. The purposes of local expenditures can scarcely be questioned, but the alarming features are the rate at which expenditures have proceeded and the shifting of the burden to future taxpayers.

Much of the total municipal indebtedness outstanding at the present time should have been paid long ago. Bonds are frequently issued for a term of years extending far beyond the life of the improvement for which the money is spent. In the South road bonds in particular are issued for terms running from 30 to 40 years. Improvements of a certain character may be permanent if proper maintenance expenditure is subsequently provided, but the chances are that most of the improvements of the past were of a temporary nature. Such a situation should never be allowed to continue, for the time will come sooner or later when the deficits will have to be paid, and the communities indulging in this practice will fall behind in the race of municipal advancement.

Causes of Increase.—In general the causes of large and growing municipal indebtedness may be summarized under the following heads ¹

- 1 Inadequate state supervision over local debts
- 2 The term of the bonds is too long when compared with the useful life of many improvements

¹ A good discussion of this matter is found in W. B. Munro, *Municipal Government and Administration*, Vol. II, Chap. XLIV.

- 3 Current expenses have frequently been met out of borrowed funds
- 4 Poor accounting. Municipal property is too frequently presented as an offset to debts
- 5 Cities have been too sanguine of their future.
6. The burden of federal taxation
7. High price level
8. High wages of labor

Defaults.—Defaults on municipal debts have in times past been of large proportions. A contemporary writer placed the total in 1884 at \$300,000,000. The states prominently represented in the list were Illinois, Missouri, Kansas, Nebraska, and the Dakotas.¹

The chief cause of defaults was the lending of municipal credit in the building of railroads. In order to induce promoters to build within a community, bond issues were resorted to, the proceeds of which were either donated to the promoters or given in exchange for the securities of the prospective roads. Many of the roads were never built, and many of those completed became insolvent after the panic of 1873. Wholesale swindling on the part of the promoters and inexcusable incompetence and extravagance of the municipal officers underlie the defaults and repudiations of the earlier period. Counties defaulting on account of aid to railroads or similar doubtful projects included Macon and St. Clair Counties in Missouri, Green and Taylor Counties in Kentucky, and Otoe County (Nebraska City Precinct) in Nebraska. Financial difficulties sometimes came from excessive public improvements as in the case of Pittsburgh, Penn., Elizabeth, N. J., and Superior, Wis. In other cases bonds were issued by communities too young to have stable values upon which taxes could be based. Such were Syracuse, Kan., Olympia, Wash., Middlesboro, Ky., and Mobile, Ala. Memphis, Tenn., and Savannah, Ga., defaulted as a result of yellow fever epidemics, while Galveston, Tex., succumbed to floods. A number of Colorado municipal irrigation districts have also defaulted on their bond issues. Among them were the Denver-St. Vrain district, the Denver-Greeley district, and the San Arroyo district. Aside from these may be numbered some defaults which had no valid reason and may be cited as examples of bad faith. These included St. Joseph, Mo., which refunded a debt at 60 cents on the dollar and with reduced interest rate, also Fort Worth, Tex., which scaled interest on a debt from 6 to 4 per cent.

In some cases full settlement of defaulted bonds was made but in many cases compromises were resorted to and frequently 50 cents of the dollar was paid, while arbitrary scaling of the principal was made in many others. In a number of instances full repudiation was resorted to as in the case of Green County, Ky. and St. Clair County, Mo.

On the whole, the attitude of the people toward repudiation of local indebtedness has been less pronounced than in the case of state debts

¹ *North American Review*, August, 1884, p. 131.

The reason suggested for this is the position taken against repudiation by the courts ¹

Recent Defaults.—For more than a generation, default in either interest or principal on municipal bonds had been practically unknown. Recently, however, the picture has changed. In the middle nineteen twenties Florida developed a hectic land boom and issued many obligations in serial form with payments to begin in 5 years for the purpose of improvements. After 1926 when the boom collapsed and the obligations came due, a large number of cities (including St. Petersburg, Miami, West Palm Beach and Orlando), counties, and school districts, defaulted. Taxes were not paid and there was no market for the land. Taxpayers in some cases tried to repudiate their obligations. It has been noticed that in practically every case (this is true outside Florida as well) where excessive debts have caused default, it has been the special assessment general obligation that has given trouble. General revenues have not been sufficient to carry the burden when special assessments broke down.

Defaults occurred in other states also. Cisco, Tex., defaulted because of a heavy debt of the water department which failed to pay its way. Cohoes, N. Y., also defaulted. But the default of Fall River, Mass., on its short-term obligations in 1930 came as a distinct surprise. In spite of the excellent laws of that state, assessed values were 20 per cent too high (the debt was only 5.5 per cent of assessed value) and the burden of the debt in the face of decreasing population and the waning textile industry caused deficits in operating revenues.

Although actual defaults did not occur, in many other places financial troubles developed from a variety of causes. Inability to collect revenues in the Chicago-Cook County situation resulted from technical difficulties. In other cases budgets have been falsely balanced on account of over-estimation of revenues or failure to provide for definite expense items. Uncollected revenues or "bad accounts" have been troublesome in other cases. These difficulties have led generally to operating deficits, which have proved a forerunner of default. Special cases of default, as in the case of Asheville, N. C., resulted from inadequate protection by real-estate collateral for deposits of public money in banks which afterwards failed.

These faults in municipal finance must be corrected to protect the good name of this form of investment. They render necessary the careful analysis of municipal obligations and the exercise of discrimination. With it all, however, with some exceptions, defaulted municipal bonds are eventually paid in full as to interest and principal.² In some of the

¹ On local defaults see W. L. Raymond, *American and Foreign Investment Bonds*, pp. 153-157.

² On recent defaults see article in *Chronicle*, Vol. 134, pp. 1431-1434.

Florida defaults, however, interest has been reduced or halved for a decade or more and maturities postponed to the distant future

To cope with the situation, a number of cities, such as Detroit and Cleveland, have wisely adopted a program of retrenchment, while others, among them New York City, have steadfastly refused to retrench or reduce salaries and operating expenses. In the latter city the floating debt represented by short-term obligations rose to \$140,000,000 and its credit sank from a 3 or 4 per cent basis to 6 per cent, the highest rate paid on money in two decades.

The Burden of Municipal Debts.—As in the case of other public debts, the burden of municipal debts can best be measured by the relation of the debts to the property and income of the people. Since municipal debts are paid mostly out of general taxation, the burden rests mostly on the real-property owners of the locality. Almost everywhere these constitute only a relatively small percentage of the population, except in the case of corporate property owned by an extensive list of stockholders. As pointed out before, property is not at all times and under all conditions even a rough index to ability to pay, it is frequently a liability. Nevertheless, tax ability represented by people receiving salaries, commissions, and the like, as well as by those receiving income from property located elsewhere, contributes nothing to the support of government where real property is the mainstay of taxes. This one-sided system of taxation places definite limits upon the amount of tax collections.

The burden of municipal indebtedness may be roughly measured by the relation of the debts to assessed valuation of property in the community. In cities of 30,000 and over, the assessed valuation of property in 1929 was only about ten times the amount of the debts. With the slump in realty values since 1929 the relationship of property to debts has been unfavorably affected and has increased greatly the burden. Individual cities show great differences in the actual burden of taxation. Quite generally, eastern cities assess real property at 100 per cent value, while in other sections of the country assessment may be as low as 15 per cent, as in the case of Iowa. The debt of New York City in 1929 was 8 per cent of the assessed value of property which is placed at 100 per cent of true value. The relationship of assessed value of property to debts in Chicago is also 8 per cent, but assessment in this case is only 37 per cent of true value. Where assessment is on the 100 per cent basis, debts of the large cities of the country are still under 10 per cent of the true value. Los Angeles, however, has assessment at 50 per cent of true value, while St. Louis with real estate assessed at 70 per cent of true value has a debt of only $3\frac{1}{3}$ per cent of valuation. New Orleans with property assessed at 85 per cent of true value has incurred a debt equal to 13 per cent of assessed valuation. The debt of this city has long been so heavy

that a special commission has been in charge since 1885. Recently assessed values in certain cities in the East and South have been materially in excess of property values. This has been a deception to bondholders who measure debts by this yardstick.

The real burden of municipal debt and taxation can best be seen by considering them in connection with other public debts and expenditures. According to calculations of the Industrial Conference Board, the total federal, state, and local taxes in the United States amounted to 7.2 per cent of national income in 1890, this was actually reduced to 6.4 per cent in 1913. In 1923 taxes amounted to 10.1 per cent of income; since then the trend has been upward, amounting to 11.5 per cent in 1929, and 14.4 per cent in 1930.¹ In individual cases the burden is far greater, owing to special expenditures. When measured on the per capita basis, taxes for all purposes have increased from \$13.88 in 1890 to \$22.26 in 1913, to \$64.68 in 1923, and to \$83.33 in 1930. The per capita taxes for local government have almost quadrupled since 1913. This undoubtedly indicated an upward trend in taxation far greater than the advance in the ability to pay.

Powers of Municipal Corporations.—Public corporations of all kinds can be created only through the sovereign power of the state. The authority to exercise the sovereign power is impliedly vested in the legislature. All public corporations in the United States, therefore, are creatures of legislation. The legislature may delegate legislative power to self-governing local communities for local purposes. The powers of corporations are defined in the constitutions and legislative enactments of the states. The general laws affecting quasi-municipal corporations are generally uniform for each class within a given state. All drainage districts, for example, will be subject to the same regulations, likewise with road, irrigation, water, and similar districts. Pure municipal corporations, however, while subject to the general laws regulating their existence, often receive a special charter from the state. These are not uniform even within a single state. The legislature grants powers to individual municipalities which it may withhold from others. Classified charter forms are now frequently used to simplify matters.

The powers of municipal and quasi-municipal corporations may be either expressly granted or implied. Express powers are contained either in the general laws or in the charter itself. Implied powers are either incidental to the powers expressly granted or essential to the declared purposes for which the corporation was created. All powers exercised by public corporations must be clearly comprehended in words or fairly implied in the language; any doubt will be construed in favor of the public and against the corporation. Powers are often granted to cities on the basis of their population, those of the highest class possessing larger

¹ *Cost of Government in the United States, 1929-1930*, p. 78

powers than those of lower classes. Municipal corporations are generally authorized to control the property and finances of the city and to pass ordinances for good order and protection from vice, intemperance, and crime. In pursuance of this, boards of health and public markets are established, slaughter houses, quarantines, and so forth, are regulated. With quasi-municipal corporations, powers are generally expressly granted for ownership of public buildings, building of bridges, construction of roads, maintenance of poor-houses, and the like. The powers possessed by this class of corporations vary greatly in the different states. Charters usually contain, also, a general welfare clause which is liberally construed by the courts.

Power of Taxation.—Municipalities, with only rare exceptions, are granted the power of taxation for certain purposes. Political and governmental necessity lies at the bottom of the power to tax, in turn, this power can be exercised only in the interest of the public welfare. But the mere fact of incorporation does not carry the power to tax. Taxation, being a governmental power, cannot be granted in perpetuity but may be revoked at the pleasure of the legislature. Civil divisions are in a sense more or less autonomous units doing what the state itself can do, but not so well as the local units. The authority of a municipality to tax may sometimes be implied if no express grant exists. It has been held by the Supreme Court of the United States that, if a municipality possesses the power to issue bonds, the power of taxation for purposes of paying interest and principal is implied. Borrowing at best is only anticipation of future revenues. The state may delegate the taxing power to any local subdivision as long as it does not extend beyond the bounds of public purpose, which usually includes education, art, beauty, charity, amusement, recreation, health, safety, comfort, convenience, and so forth. It is well settled in most jurisdictions that the power of taxation may be delegated to fire, irrigation, sewer, and similar districts referred to above as quasi-municipal corporations.

Municipalities almost universally depend upon some form of property tax for their revenues. Income taxes have been levied directly by state authority, and a portion of the proceeds distributed to the local governmental bodies as in the case of Massachusetts. Likewise, poll taxes are commonly levied, using the proceeds for municipal purposes. Excise taxes in the form of licenses or occupation taxes are sometimes levied. But the main dependence for municipal revenues has always been on property located within the jurisdiction of the taxing district.

Municipalities are carefully guarded by state laws in borrowing money. It is usually the case that the statute which provides for bond issues also makes it compulsory upon the municipality to levy a tax which will take care of both principal and interest. This is the rule in New York and many other states. The Pierson Budget Act of 1917 in New Jersey

compelled a municipality to include in its annual budget sufficient taxes to pay all interest and maturing principal and in addition money for sinking funds.

Bonds are sometimes supported by the full taxing power of the municipality and sometimes only by a limited power. Courts are limited in the enforcement of taxation to satisfy bond issues by restrictions upon the taxing power, otherwise they would exercise legislative authority, which is beyond their province. Sometimes the state limits the amount of taxes that may be levied for municipal purposes. New York thus limits the levy to 2 per cent of the assessed valuation of the real and personal property with the municipality but does not include in this taxes for debt service, which are unlimited. This represents the best condition for the bondholder, for he is sure that no legal restrictions stand in the way of adequate provision for the debts of the municipality. The same rule prevails in New Jersey and in most other states.

On the other hand, some states limit taxes for all purposes to a certain percentage of assessed valuation. For instance, the state of Ohio in 1910 passed the Smith One Per Cent Law limiting municipal taxes to 1 per cent of property valuation, this was afterwards extended to 15 mills. In 1923, the legislature amended the Smith law by providing that taxes should not exceed 14 mills on the dollar and were not to include taxes for payment of principal or interest or sinking funds for the debt service. This places Ohio in substantially the same position as New York. The wisdom of tax limitation is seriously disputed. It has led in practice in Ohio and other places to deficits in current finance and subsequent funding of the floating debt. The limitation of the power to tax for debt service is rapidly passing. It is recognized everywhere that such provisions only injure credit, because of the failure to place back of bond issues the full power of the municipality to discharge its obligations. Municipalities have usually brought pressure to bear sufficient to have the limit raised or set aside by court authority. Tax limitation narrows the market for municipal bonds. It renders them unacceptable to the Postal Savings system and to large insurance companies. Among the states formerly bound by narrow constitutional restriction on the taxing power, Alabama was the last to see the light and has bettered her condition but still maintains a limit on the power to tax for debt purposes.

Borrowing Power.—The constitutions and laws of the states, to which must be added the charters of cities and villages, constitute the fundamental regulation of municipal indebtedness. Upon these provisions the legality of issues depends. It is, therefore, of the highest importance that constitutions, statutes, and charters be minutely scrutinized by the bond attorney in order to make sure of the validity of bond issues.

All public corporations have the power to make contracts with third persons. In the absence of a forbidding clause, a municipal corporation

has the general implied power to make such contracts as are necessary for the purpose of performing its functions

A municipal corporation can bind itself only by such contracts as are reasonably within its purposes, and there is no estoppel against it to deny the validity of a contract which is beyond such purposes, or which has been made in violation of charter requirements.¹

The constitutional rights of third persons against a public corporation as debtor cannot be revoked by the legislature which exercises control over the corporation, for to do so would be an infringement upon the principle that states under the federal Constitution cannot impair the obligation of contracts

In case of private corporations, the power to borrow money was early considered an implied power inferred under certain charter provisions, in the case of municipal corporations, however, judicial opinion is somewhat at variance. The courts have felt the necessity of stricter interpretation of charters where no express grant is given. It is the view of Judge Dillon that, where no express grant is given to a municipality, no general implied or incidental power of borrowing money exists. Such power may result, however, from some express authority which necessarily implies it. Even in this case the borrowing must be essential to carry out the purpose contemplated by the legislature.

The modern tendency of the Supreme Court is committed to the view that the power "to borrow money or to contract a loan does not necessarily, at least, include the implied power to issue."² Bonds issued by an *ultra vires* act of a corporation cannot be validated by the corporation, for lack of authority to issue also extends to lack of authority to validate. But where invalidity results from some minor irregularity, the bonds may be validated by proper action. The legislature may even step in to make a bond issue valid if necessary, where it possesses adequate authority to take such action. The authority to make local improvements and carry on the functions of government does not in itself convey the right to borrow money for these purposes. Borrowing is rather an abnormal procedure with municipalities. Furthermore, the duties usually incumbent upon municipalities do not make it necessary to imply the existence of a general power to borrow money, as in the case of private corporations. Where the express power to borrow is not given, in order to have all suspicion of illegality removed, the bonds should always be passed upon by competent authority. For if the statutes of a state or the articles of municipal incorporation do not expressly grant the power, the municipality is not bound by its bond issue, to be thus bound would exceed statute authority. Where the power to borrow is limited to

¹ C. B. ELLIOTT, *Municipal Corporations*, p. 39

² J. F. DILLON, *Municipal Corporations*, Vol. II, p. 1330

specified purposes, the municipality cannot legally exceed these purposes. In practice, where the power to borrow with reference to a specific purpose is brought in question, the authority to borrow must be clearly shown and cannot be inferred from any evidence in the case. So well recognized is this principle that the newer statutes, charters, or amendments to existing laws almost invariably confer in express language ample powers to accomplish the purposes for which the municipalities were created. Many legal uncertainties are thus avoided.

Bonds may be issued only for public purposes because they are to be paid out of taxation which itself may not be levied except for public purposes which specifically include the paving of streets, construction of public buildings, acquiring electric plants, or similar purposes. It is legal for public corporations to issue bonds for aid in the construction of railroads on the ground that transportation is a public necessity. They may also make subscriptions to capital stock or donations to corporations. No such power exists, however, with reference to industrial corporations which operate exclusively for private ends, and bonds issued for this purpose would be invalid at inception. In the final analysis the courts, limited only by a sound public policy, possess the authority to decide what is a public purpose.

Legality.—Constitutional or legal conditions imposed upon public corporations in issuing bonds must be complied with if the issue is to be legal or valid. Most states now require the consent of a certain proportion of the people, obtained by general or special election, before bonds can be issued. Irregularities, however, which do not affect the result of the election will not invalidate the bonds in the hands of innocent purchasers. Want of power to issue is always a defense to an action on municipal securities, even as against a *bona fide* holder. Want of power may arise because the issue is not for a public purpose, because the enabling statute is unconstitutional, or because statutory conditions were not complied with. Purchasers take the responsibility of the genuineness of signatures of public officials in connection with bonds. In case a court judgment has been secured against a public corporation, no question of the lack of power can be raised.

Specific laws regulating municipal borrowing are undergoing constant revision. A large volume would be necessary to give adequate account of these laws. Certain principles, however, are becoming more and more recognized as desirable and are being enacted into law by many states. For instance, the general municipal laws of New York provide that

• a funded debt shall not be contracted by a municipal corporation, except for a specific object, expressly stated in the ordinance or resolution proposing it. . . Such ordinance or resolution shall provide for raising annually, by tax, a sum sufficient to pay the interest and the principal, as the same shall become due.¹

¹ Consolidated Laws, Chap. 24, Sec. 6

Special provisions relate to the levying of taxes sufficient for debt purposes and, also, for refunding of old maturing bonds. The General City Law provides that cities may become indebted

for any public or municipal purpose and to issue therefor the obligations of the city, to determine upon the form and terms and conditions thereof, and to pledge the faith and credit of the city for payment of principal and interest thereof, or to make the same payable out of a charge or lien upon specific properties or revenues¹

Provision is also made for sinking funds, refunding, and so forth. Second-class cities are also permitted to borrow for any municipal purpose. The law affecting counties seems to be almost equally liberal, although some specific purposes are mentioned in the act. The Pierson Act in New Jersey and the Municipal Finance Act of North Carolina contain provisions very similar to the New York statutes. In addition, the Pierson Act requires that the length of the bonds shall not exceed the lifetime of the improvements as defined in the act.

Debt Limitations.—As creatures of the sovereign state, municipal corporations are under the control of states in debt matters. Restrictions are to be found sometimes in state constitutions, sometimes in statute law or in municipal charters. Sometimes these limitations apply to all subordinate civil divisions of the state alike, in other cases the civil divisions are classified for this purpose and limits set for each class. In the states of Delaware, Maryland, Nebraska, Nevada, Oregon, Tennessee, and Texas no general constitutional or statutory limits are to be found.² On the other hand, the constitution of Arkansas absolutely forbids bond issues of cities, towns, or counties, except to provide for existing indebtedness. From this rule the Supreme Court of the state has excepted improvement districts of practically all descriptions. As a result, the improvement district has become the accepted vehicle for local borrowing in that state.

The most common limitation on debts restricts the amount to a certain percentage of the assessed value of the property within the municipality. In Maine the limit is 5 per cent, except in Portland, which is limited to 7½ per cent, Massachusetts limits the indebtedness of cities, except Boston, to 2½ per cent and towns to 3 per cent of the average assessed value for 3 years preceding. Authorization by the legislature for special debts is possible. Sinking funds must first be deducted in calculating the net debt. This latter provision is also found in a number of other states. Connecticut limits the amount to 5 per cent of the grand list except by special legislative permission, and after deducting debts incurred for specified public utilities. Pennsylvania has complicated

¹ Consolidated Laws, Chap. 21, Sec. 20.

² W. T. RAYMOND, *State and Municipal Bonds*, p. 286.

provisions, the effect of which is generally to limit indebtedness to 7 per cent and in some cases to 10 per cent of the assessed valuation. Ohio has perhaps experimented with debt limitation more than any other state. By the revision of 1921, limitations of net indebtedness for different classes of municipalities range from $2\frac{1}{2}$ to 5 per cent of the assessed valuation. Indiana, by constitutional provision, limits the amount to 2 per cent; while Illinois, also by constitutional law, limits the amount to 5 per cent. Michigan has 10 per cent for cities and villages, with the possibility of increasing it by special permission, counties are allowed only 3 per cent. Wisconsin places a limit of 5 per cent on all municipalities. The case of Missouri is different from most other states in that no debt shall be created unless by vote of two-thirds of the people and then only up to 5 per cent of the property assessment. Wyoming limits the amount to 2 per cent and an additional 4 per cent for sewers and school districts. In California a limit of 15 per cent exists with the additional provision that bonds shall not run longer than 40 years. Nebraska and Tennessee are peculiar in that they permit indebtedness in aid of internal improvements. In Nebraska this is permitted by vote of the people up to 10 per cent of the assessed valuation, which may be increased to 15 per cent by a two-thirds vote. In Tennessee all such indebtedness must be sanctioned by three-fourths of the vote of the people. The Pierson Act in New Jersey limits indebtedness to 7 per cent of the assessed valuation of real property for the 3 years preceding for a "municipality," and to 4 per cent for a county. Certain exceptions are made to the limits in case of school districts and current expenses and an additional 2 per cent allowed where the debt was heavy at the time the act went into force. New York limits municipal indebtedness to 10 per cent of real-estate valuation. North Carolina in the Municipal Finance Act limits bonded indebtedness to 8 per cent of property valuations. Sinking funds and debts incurred for public utilities, such as water, gas, and electric plants, are first deducted in determining the net debt.

If bonds are within the debt limit when issued, they remain valid by court decisions till maturity, if then refunded they continue valid, regardless of the other issues which might have made the total amount of indebtedness excessive. On the other hand, no bond issue if declared absolutely void beyond a certain limit by the constitution will become legal by subsequent reduction of any part of the municipal debt. Likewise, a limited tax rate, out of which bond issues are to be paid, limits the obligation to that rate because the debtor is legally unable to provide funds for the payment of interest or principal.

Invalidity.—Bonds are invalid or void when the municipality is under no obligation to make settlement for them. A bond void at its inception cannot be made valid subsequently. The municipality must have issued the bond for value received or the contract is void. Invalidity in the

past has been the chief reason or excuse for default in municipal bonds. The causes of invalidity are difficult to analyze. Bond contracts, including as they do constitutional and legal provisions, must in every way conform to all such stipulations, moreover, they must be strictly in accordance with the charter provisions of the municipality which issues them. In the first place, the authority to issue must be clear. It must be either expressed or clearly implied in the charter and laws of the state. "Certainly issues made under a special legislative act should be avoided, as the courts are at variance in their decisions of these cases."¹

The purpose of issue must coincide with the powers granted. In case of counties and taxing districts, the purpose is almost always clear because it is stated in express terms in the charter, but in case of municipalities proper, the only guide seems to be that the bond issue shall serve a public purpose which is as elastic as the corresponding provision in the tax clause. Perhaps most mistakes in municipal bond issues in the past have been made through the commission of some more or less unimportant error in the process of issue. Common among these may be mentioned failure of submission to the people of both the bond issue and the taxing provisions out of which it is to be paid; also, errors in election for approval of the bonds, irregularities in motion to authorize the issue, failure to specify interest rate, and so forth, are common. Any minor errors may cause illegality but less often invalidity. Lastly may be mentioned the fact that municipal bond issues may exceed the debt limit or require the levying of taxes in excess of the amount permitted by statute.

Sometimes cases of illegality have, nevertheless, been declared valid by courts. This has been done especially where the illegality is only the result of minor errors in procedure. Especially if these bonds fall into the hands of innocent purchasers, federal courts and many state courts will declare the issue valid in spite of its illegality. Also, even if a municipality goes beyond its power of issuing bonds but, nevertheless, receives the full benefits of the proceeds of the issue, the court will probably hold the issue valid. Cases declared valid, although illegal, are binding on the municipality the same as if no legal error had been committed. Bond attorneys frequently refuse issues of municipalities because of some error. Rapidly changing officials, especially in the smaller districts and villages, naturally know very little about bonds and it is surprising that more errors do not occur than actually appear. Here the bond attorney of the investment house serves as tutor to the officials.

Validation.—In order to avoid uncertainty regarding the validity of municipal and state bonds, some states have provided for validation and registration. Validation is accomplished by statute declaring that bonds issued under enabling statutes shall be incontestable after the passage of a certain number of days. Sometimes certification by means of registration

¹ W. E. LAGERQUIST, *Investment Analysis*, p. 578

with state or county officials is also required. These methods of assurance greatly strengthen bonds of municipalities. They are in line with judicial thought and supplement the efforts of bond attorneys. Municipal bonds usually stand or fall on the basis of validity and too great caution in this respect cannot be taken.

Warrants.—Counties, towns, and municipal corporations have implied authority to issue warrants or orders for services rendered or property purchased. They must be issued for a legal purpose and for the amount due, since they are not subject to discount. Such warrants are not negotiable instruments and the purchaser holds them subject to defenses which are available between the original parties. Special caution is needed, therefore, in the purchase of these obligations. When drawn on a specific fund, warrants are not payable out of the general revenues of the municipality. The claim of *ultra vires* is always possible to a municipality.

Bonds—Municipal bonds are generally debentures, and it is only in rare instances, as when a municipality acquires a public utility from private interests with mortgage bonds outstanding, that they become liens upon property. Liens carry the right of sale and foreclosure, consequently municipalities almost everywhere issue straight obligations which become payable out of general taxes, this is true even in cases where the proceeds are spent upon waterworks or other revenue-producing property. All municipal bonds of this nature have equal claims upon the resources of the municipality. Increases in debts, therefore, operate to weaken all securities of the corporation concerned, and investors have a vital interest not only in the present but also future indebtedness of the municipality whose bonds they purchase.

The ideal American municipal bond is an obligation for the payment of which taxes may be levied without limit. Bonds are sometimes issued with a mortgage lien upon municipal utilities. If also supported by the general taxing power, they are very strong bonds. Bonds of municipal waterworks are usually the best of these types, since the utility requires relatively little skill in management.

Special Assessment Bonds.—Special assessment bonds constitute a class by themselves. They are issued for improvements in the various districts above classified as quasi-municipalities, such as for paving streets, constructing sewers, drainage, and levees. In some states these bonds are general obligations of the municipalities, in which case they do not differ from the ordinary municipal obligation. In others they are a charge in the first instance upon the abutting property but if unpaid at maturity become a pure municipal obligation. In the state of Washington, for instance, these bonds are a charge only upon the abutting property and in no case become a municipal obligation. Here instalments of principal paid by property owners are used to redeem the bonds which

are callable In practice, it works out that the most dependable class of property owners pay off their portion of the assessment, whereupon bonds in equal amount are canceled, this leaves only the poorest class of property owners and owners of vacant lots as security for the remaining outstanding bonds. Such bonds are exceptionally inferior in character and hardly are worthy of the name of municipal bonds They are especially in a precarious position when issued to cover improvements in a new section of a city where uncertainty as to the future prevails.

Remedy in Default.—Default occurs in municipal bonds as in other bonds when interest or principal payments are not met when due Default on interest, however, does not mature the principal, nor does default on one or more of a series in serial bonds mature the remainder of the serial issue. In case of default, the bondholder has recourse to the judicial and executive branches of the state government The defaulting municipality may be sued in the same way as a private corporation This distinguishes municipal from federal and state contracts

Bonds which are issued without any special manner of payment provided are a charge upon the general levy of taxes In case the law has provided for a special tax and officials are unwilling to impose the necessary levy, the remedy is to apply to a court with jurisdiction, usually a federal court, for a writ of mandamus directing the officers concerned to levy and collect taxes sufficient to satisfy the obligation A writ of mandamus will not be granted if remedy may be secured by civil suit and judgment, if the judgment can be enforced in any other way The federal courts require a judgment first, with some effort to collect under it, if this is unavailing, a writ of mandamus will be granted In case officials then refuse to act, they may be committed to jail for contempt of court In case the tax limit prevents sufficient funds from being collected for the payment of the bonds, the courts are powerless to exceed the limit, whether it applies to the general taxes or only to debt service To do otherwise would be the exercise of legislative power which is unconstitutional It is clearly shown in these cases that the general statutes relating to debt and limitation of taxes for the payment of bonds are a part of the general contract with bondholders If corporations exceed their powers, the contracts will not be upheld by the courts. Bonds thus issued are illegal.

Sinking Funds.—Sinking funds constitute still a very common method of payment of municipal debts In some states this is required by statute; in others municipalities voluntarily establish sinking funds. The legal right of the creditor to the sinking fund seems to be unquestioned

If the ordinance or statute authorizing the bond issue provides for a sinking fund, this provision is part of the contract between the municipality and the bondholder, and the rights of the latter to insist upon the protection of the

sinking fund cannot be impaired by any subsequent legislative enactment or by the issuing municipality. This is so because of the constitutional guarantees against impairing the obligations of contracts.¹

Contrary to the usual notion, sinking funds for the most part have been well managed. Occasionally a municipality may be found where the officials have neglected to establish sufficient taxes to meet sinking-fund requirements, in other cases they have been totally ignored, so that when the bonds have fallen due no alternative is open except the refunding of the issue, a practice which is thoroughly bad. The credit of municipalities is bound to suffer under such conditions. Certain large purchasers of municipal bonds, insurance companies for example, have announced their intention of refraining from purchasing the bonds of municipalities which have shown laxness with reference to the maintenance of sinking funds. Sometimes officials borrow from the sinking funds for other purposes, as for current expenses. Some municipalities have attempted to borrow to maintain the sinking fund intact, but courts have refused to sanction this practice. A closer supervision of the state over the finances of the smaller municipalities would probably eliminate all the abuses which have crept into the sinking funds. Sinking funds are usually invested in the securities of the same municipality. When sinking funds are properly provided, they cover each issue of bonds separately, the general sinking fund is to be looked upon as too indefinite and should be discouraged. Sinking funds have sometimes been used to purchase new bond issues representing increased indebtedness of the same municipality, thus defeating their real purpose.

Serial Issues.—On account of abuses in the past, especially in the case of small municipalities, certain states among which are New Jersey, New York, North Carolina, and Massachusetts, to mention only a few, have discontinued sinking funds for new issues, replacing them by serial bonds. The amount of bonds maturing each year should be arranged so that the amount plus the annual interest on the outstanding portions be somewhat nearly the same, in this way the burden of the debt is evenly distributed. The serial-bond method is in almost every way superior to the sinking-fund method. It insures cancelation of successive portions of the debt each year until it is all paid at the most distant maturity date. The serial-bond method acts as a constant protection to the credit of the municipality and there can be no worry about methods of handling the sinking fund.

On the other hand, the present weight of municipal debts and taxation has brought out the weakness of serial bonds. The severe depression rendered it difficult for many municipalities to meet their obligations, recent defaulted bonds were largely of the serial type. In addition to

¹ FRASER BROWN, *Municipal Bonds*, p. 75

this there is a distinct disadvantage in serial issues in the presence of financial troubles. Bonds have to be paid at face value, whereas if sinking funds were used redemption through purchase in the open market would save the municipality considerable money

The comparative cost of the sinking-fund and serial-bond methods may be seen in Table 76, taken from the *Engineering News-Record* of August 30, 1917 ¹

TABLE 76 — COMPARATIVE COST OF SERIAL AND SINKING-FUND PLANS, \$100,000, 5 PER CENT BONDS

Annual average debt service			Total cost	
Maturing in years	3½ per cent sinking fund	Serial	3½ per cent sinking fund	Serial
5	\$23,648	\$23,000	\$118,241	\$115,000
10	13,524	12,750	135,241	127,500
15	10,183	9,333	152,738	140,000
20	8,536	7,625	170,722	152,500
25	7,567	6,600	189,185	165,000
30	6,937	5,917	208,114	177,500
35	6,500	5,429	227,494	190,000
40	6,183	5,063	247,309	202,500
45	5,945	4,778	267,540	215,000
50	5,763	4,550	288,169	227,500

It will be observed that in every case the annual average cost by the sinking-fund method is greater than by the serial method, and that, the longer the period of maturity, the greater is the discrepancy. The same remarks apply, also, to the total cost of financing by these two methods. The disadvantages of the serial method of issuing bonds are to be found chiefly in the difficulty in quoting prices. Since maturities differ, prices will vary upon a given yield basis depending on the date of maturity itself. Serial issues are also more difficult to list but listing of municipal bonds is a rare occurrence at any rate. The market for these issues is concentrated, and the over-the-counter method of sale is usually employed.

Irrigation Bonds — Irrigation bonds are a type of special assessment bonds when issued by a taxing district. The great bulk of irrigation bonds come from tax districts. As such, they are subject to the general principles of municipal bonds. Bonds vary in maturity from 10 to 20 or more years. They are issued in serial form and constitute a prior lien, together with ordinary taxes, upon the lands affected. Since these bonds are mortgages upon the land and irrigation works, bondholders have the privilege, in case of default, of foreclosure and sale. They are primarily

¹ FRASER BROWN, *Municipal Bonds*, p. 81

obligations of the districts concerned and are not usually subject to payment out of general taxes. Each bond issue must stand or fall by the property upon which it is a lien

District irrigation bonds must be distinguished from both private and Carey Act bonds. Private companies were first to undertake projects and furnished practically all of the money for their construction in the early period. Carey Act bonds came to the notice of the investing public after the panic of 1893. This Act, passed by Congress in 1894, was for the purpose of enabling western states to settle arid regions through assistance of the Federal Government. The lands affected were passed from the federal to the state governments, and subsequently to the farmers accepting the conditions of irrigation, full title passing only after the land was under cultivation. The corporation undertaking the irrigation is given a first lien upon the lands which the government agrees to sell to actual settlers in amounts not to exceed 160 acres each. Only 20 acres, however, need be put under cultivation. The water rights are acquired from the corporation by the settlers at a price fixed by the state engineer, partly paid in cash and the remainder in annual instalments. Colorado, Idaho, Wyoming, and Montana have made most use of the Carey Act. The bonds issued under this act are in no sense municipal bonds but are so closely connected in other ways with the district bonds that they may best be treated at this point. They are strictly private bonds with a lien upon the lands of the settlers, the titles are unquestioned, since they are guaranteed by the United States.

Both private irrigation and Carey Act bonds are of small importance today, it being recognized that the only substantial method of irrigation is either at the cost of the Federal Government, which assumes financial responsibility and furnishes the funds through the Reclamation Service, or through the district irrigation system. These two methods of financing irrigation, however, paved the way for the district method. Like all pioneering projects, numerous and calamitous mistakes were made, resulting in bitter experience to the bondholders. Private companies entered fields far away from transportation facilities, which rendered failure certain. Carey Act bonds and private corporation bonds depended for their soundness on the sale of the land to actual settlers and their ability to cultivate it. Farmers usually came from remote districts, knowing little or nothing about irrigation farming and possessing little capital, the result was generally disastrous, the settlers leaving, and the bondholders' only recourse was to take possession of worthless lands and water rights. Promoters of the projects were often dishonest, sometimes only 50 per cent of the funds were used for their intended purpose, the promoters absconding with the balance. Often capital was insufficient to complete the undertaking, while sometimes water proved insufficient, poor construction, bad management, lack of settlers, no market for the

products, and all of the difficulties of a new country tell the story of failure of these early projects.

On the other hand, not all of the special tax district projects in their earlier days turned out successfully. Many defaults and sad experiences of bondholders may be recounted from 1909 to 1911. Since that time, however, district irrigation has been vastly improved, the statutes of the western states have been perfected and little or no trouble has been given bondholders within the past decade. The laws which are recognized to be the best provide for state commissions whose duty it is to investigate all prospective projects as to water supply, soil, value of water rights and lands, and the general feasibility of the project. The bonds must be certified by these commissions, whereupon they become legal for savings banks and trust funds within the state. Such are the requirements of the states of California, Oregon, Utah, Arizona, Nevada, and Idaho. California led the states in the movement for sound irrigation laws, but the laws of Oregon are regarded by some as even superior to those of California. This, however, may be only a temporary condition, since at any time laws may be revised giving added advantages to one state or another. It is recognized that the county should assume the assessment and collection of taxes instead of the district. It is thought best, also, to call the bonds "Water Conservation Bonds," in order to dissociate the better bonds from their inferior predecessors. In fact, California, Arizona, and Utah have already passed statutes to that effect, while the matter of proper assessment of taxes is also receiving careful attention in all of the states.

At the present time, there are four methods of assessment found in practice. In California, it is a property tax based on the valuation of the land benefited, in Oregon, there is a fixed tax per acre, in Nevada, assessment is according to benefits received, and in Utah, it is based upon individual water allotment. The Chairman of the Committee on Irrigation Securities of the Investment Bankers Association favors the Oregon method. While this has its drawbacks, it is probably best in the long run and gives the investor greatest assurance.

District irrigation bonds are superior to the former types because they are generally issued on lands which at the time of undertaking the projects are worth considerable. Irrigation merely adds to the value, the people from the beginning being actual cultivators of the land and constituting a part of an established community. The amount of the assessment in such cases is usually much less in proportion to the value of the lands than under former methods; bonds issued in this fashion are valuable investments. The market hitherto has been chiefly in the state where the project is located or in an adjoining state. The bonds usually bear 6 per cent interest and are bought by individuals, savings banks, trust funds, and so forth. They proved very stable in value during the

1920 depression, exceeding even municipal issues in this quality. These issues are tax-exempt for both federal and state taxes.¹

Drainage, Levee, and River-bank Protection Bonds.—Like irrigation bonds, drainage, levee, and river-bank protection bonds may be issued by private companies or through organization of special assessment districts. Experience with this class of bonds is limited mostly to the past 20 years. These issues differ in no essential respect from irrigation bonds. Their legality and validity are subject to the same general principles as other municipals. The laws of the different states affecting drainage districts are fairly uniform and provide for assessment upon the lands affected, according to the special benefits derived from the improvements. The bonds are issued serially and run from 15 to 25 or 30 years. They constitute a lien on the lands which may be sold at foreclosure, in most instances, to satisfy bondholders. The courts will insist upon protection to the bondholders in case of financial difficulties. The district is usually coterminous with a county, or in case of large projects it includes several counties. Taxes are levied by county authority in much the same way as other taxes. Generally the amount levied will include 10 per cent more than is required for the interest and principal payments falling due in any one year. This principle is worthy of emulation in other special assessment bonds. Some of the bonds are paid off annually and the equity back of the remaining ones constantly increases.

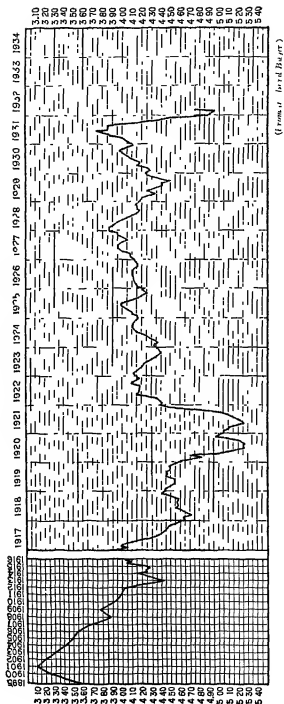
Drainage bonds usually are issued on lands which are already valuable and being cultivated to some extent at least. Generally the value of the land is from three to five times that of the bonds issued, while the improvements add still further to the value. Drainage, as well as levee bonds, have been issued chiefly by the states of Arkansas, Louisiana, Missouri, and others of the Mississippi and Ohio River valleys; some have been issued in California, Nebraska, and other states.

Levee bonds are essentially the same as drainage bonds, they are not so favorably regarded by investors because of the danger of overflow and possible engineering defects which would destroy a large part of the value of the lands protected. The Federal Government has provided most of the levees, at any rate, and the amount of bonds issued is only about one-fifth that of drainage bonds.

All bonds discussed under this section are free from federal income taxes but may be taxed by state authority as all other municipal bonds. In Nebraska all classes of municipal bonds are taxed to Nebraska holders at the rate of 10 cents per \$100. The market for drainage bonds has until recently been local, St. Louis being the largest market. The yield is $5\frac{1}{2}$ to 6 per cent.

¹ Valuable information concerning district irrigation bonds is contained in the annual reports of the Irrigation Securities Committee of the Investment Bankers Association of America, especially for 1921 and 1922.

CHART ON MUNICIPAL BOND PRICES



Municipal Bond Prices.—The course of municipal bond prices during recent years is shown in the chart on page 670

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CHAPTER XXXV

FOREIGN INVESTMENTS

Until the World War America was a debtor nation. In 1914 approximately \$4,000,000,000 par value of stocks and bonds of American corporations with annual interest and dividend payments approaching \$200,000,000 were held abroad, chiefly by England, France, and Holland.

In 1900 foreign securities held in the United States probably did not amount to over \$25,000,000. During the next 15 years Japan, Germany, Cuba, San Domingo, Argentina, Austria, and China all secured capital in this country in exchange for their securities. At the outbreak of the World War a few Canadian (mostly corporate), Cuban, Japanese, Mexican, and Philippine bonds constituted the bulk of America's portfolio investments abroad. In all probability about \$200,000,000 of foreign long-term securities were held by American investors.¹

America a Creditor Nation—The World War completely changed the situation. American securities held abroad were mobilized by foreign governments and resold to American investors in order to realize funds in this country for the purchase of materials and supplies. In addition the British and French Governments jointly floated the Anglo-French loan of \$500,000,000, while the French cities of Paris, Lyon, and Bordeaux also raised funds through the sale of bonds here. It has been estimated that \$1,518,000,000 of the \$2,704,000,000 of railroad securities alone held abroad in 1914 were returned to the United States before 1917, which marks the year of our entrance into the war. American credits thus acquired abroad completely offset the American debt abroad by 1917.²

With the entrance of the United States into the war, American investments in foreign countries were made on a grand scale. These were handled through the Government of the United States, which extended credits to the allied countries, receiving in return government notes as recognition of the debts. The Government of the United States raised the money through the sale of Liberty bonds, certificates of indebtedness, War Savings Stamps and certificates, and so forth. Thus, indirectly, the people of this country supplied the funds which the government turned over to the allied nations. Exclusive of accrued interest, \$9,600,000,000 was loaned to foreign countries by the United States.

¹ United States Department of Commerce, *A New Estimate of American Investments Abroad, Trade Information Bulletin* 767, p. 24

² *Commercial and Financial Chronicle*, Oct. 30, 1920, p. 1076

After the war, securities of foreign governments, national, state or provincial, and local, as well as of foreign corporations, were sold to American investors in large amounts. From 1922 to 1930 long-term investments in foreign securities showed a net increase of \$4,606,000,000. In addition direct investments by American corporations of the proceeds of securities sold for foreign investments amounted to \$1,100,000,000. Total foreign securities held by American investors increased from \$2,598,000,000 at the beginning of 1922 to \$7,204,218,000 at the end of 1930.¹ These loans were made to countries in all quarters of the globe.

TABLE 77—AMERICAN INVESTMENTS ABROAD IN 1900, 1909, 1912, AND 1930
(In thousands)

Area	1900	1909	1912	1930 ¹
Europe	\$ 10,000	\$ 350,000	\$ 200,000	\$ 4,929,277
Canada	150,000	500,000	400,000	3,941,893
Mexico	185,000	700,000	800,000	807,777
Central America	10,000	50,000	40,000	180,799
South America	35,000	100,000	175,000	3,041,926
Cuba	50,000	130,000	220,000	1,066,551
Other West Indies	10,000	15,000	7,500	166,933
Africa				117,829
Asia	5,000	175,000	60,000	1,022,949
Oceania				419,294
Life insurance guarantee investments	45,000			
Total	\$500,000	\$2,020,000	\$1,902,500	\$15,675,028

From *Trade Information Bulletin* 767, p. 24

NOTE.—The 1900 estimates were by Nathaniel T. Bacon, *American International Indebtedness*, *Yale Review*, November, 1900, p. 265 *et seq.*, the 1909 estimates by Charles F. Spears, *Foreign Investments of the Nations*, *North American Review*, July, 1909, pp. 82-92, and those for 1912 by John B. Osborne, *North American Review*, May, 1912, p. 687 *et seq.*

¹ The figures in this column are subject to several qualifications, particularly an estimated deduction of \$630,000,000 for the international securities movement and the addition of \$128,000,000 for insurance company and bank capital. Neither of these items could be divided by areas.

* Including Porto Rico

* Near East and Far East combined

American investments abroad, however, do not end with portfolio investments but include also the so-called "direct" investments. These are investments by American business enterprises in foreign countries and have always amounted to more than the portfolio investments. The rapid increase in the latter during the past decade brought their total almost to the figure for the former, which at the end of 1930 was \$7,840,-810,000. American capital invested in Europe amounted to about \$4,500,000,000 at the end of 1930, Canada accounted for \$3,790,000,000, and South America for \$3,040,000,000. Of the portfolio investments

¹ United States Department of Commerce, *Trade Information Bulletin* 767, pp. 8, 25.

Europe accounted for the largest amount, \$3,460,629,000, while Canada and South America showed \$1,892,000,000 and \$1,410,821,000, respectively.¹ The Department of Commerce has compiled a historical table of the growth of American investments abroad as shown on page 673. By far the largest amount of both portfolio and direct investments in Europe was in Germany. Other important countries were Great Britain, Sweden, Italy, France, Denmark, and Belgium. In South America, Argentina stands highest, with large amounts also in Chile, Brazil, Colombia, Peru, Venezuela, and Bolivia. Large amounts are also invested in Cuba, Mexico, Japan, the East Indies, and the Philippines. Details of these countries follow.

TABLE 78.—PRIVATE AMERICAN LONG-TERM INVESTMENTS IN LEADING COUNTRIES
AT END OF 1930
(In thousands)

Country	Direct	Portfolio	Total
Europe			
Austria	\$ 17,377	\$ 97,688	\$ 115,065
Belgium	65,246	188,965	254,211
Denmark	15,924	167,799	183,723
France	161,809	309,525	471,334
Germany	243,969	1,176,988	1,420,957
Great Britain	497,305	143,587	640,892
Hungary	9,520	109,358	118,878
Italy	121,216	279,924	401,140
Netherlands	44,024	122,574	166,598
Norway	23,470	190,878	214,348
Poland	53,193	124,130	177,323
Sweden	19,230	253,536	272,766
Latin America			
Argentina	358,519	489,258	807,777
Bolivia	61,619	54,424	116,043
Brazil	210,166	346,835	557,001
Chile	440,843	260,092	700,935
Colombia	122,994	170,698	301,692
Peru	124,742	75,343	200,085
Venezuela	247,238		247,238
Cuba	935,706	130,845	1,066,551
Mexico	694,786	115,735	810,571
Orient:			
China	129,768	46,000	175,768
Japan	61,450	383,189	444,639
Netherlands, East Indies	66,212	135,121	201,333
Philippines	81,435	84,810	166,245

From United States Department of Commerce, *Trade Information Bulletin* 767

¹ *Ibid*, p. 8.

When classified according to private or public obligations, the totals for the various geographical divisions are as follows

TABLE 79—FOREIGN PORTFOLIO INVESTMENTS BY CLASSES AT END OF 1930
(In thousands)

DIVISION	Government	Government guaranteed corporate	Private corporate	Total
Canada and Newfoundland	\$ 857,185	\$ 412,674	\$ 623,047	\$1,892,906
Europe	1,934,335	623,194	894,100	3,460,629
Latin America	1,469,088	105,826	35,124	1,610,038
Other	674,162	37,719	158,764	870,645
Total	\$4,934,770	\$1,188,413	\$1,711,035	\$7,834,218

From United States Department of Commerce, *Trade Information Bulletin* 767

It will be observed that by far the larger portion of foreign portfolio investments has been occasioned by government borrowing. Of the total \$4,934,770,000 of governments, \$3,258,987,000, or 66 per cent, was for national governments, \$896,696,000, or 18 per cent, for state or provincial governments, and \$779,087,000, or 16 per cent, for municipalities and other minor civil divisions.

Foreign investments have been materially reduced through sinking-fund and redemption payments. Since 1912, payments to the extent of \$3,300,000,000 have been made; during the period 1922-1930 alone, \$2,026,000,000 have thus been paid.¹

Purposes of Issues.—Foreign bonds have been issued and floated in the United States for almost every conceivable purpose. The proceeds of some, as in the case of the Japanese Oriental Development issues, have been used for productive purposes. But the proceeds of most issues were used for unproductive purposes. In Germany they were used to pay reparations, to provide municipal bath houses, parks, and the like, and to meet budget deficits. The latter purpose has not been confined to Germany. For example, deficits in Bolivian finances from 1921-1928 were partially met in this way, \$5,000,000 of the proceeds of bond sales went to pay for munitions of war. In Brazil several hundred millions were used largely to finance the unsound valorization of coffee. Even where funds were used directly or indirectly to increase production, the schemes were generally unsound. This was the case with Peru irrigation works, with coffee plantations in Brazil, Colombia, and Central America, with sugar in Cuba, Peru, and Central America, with cotton in Peru, with wheat in Argentina, with copper in Chile and Peru, with tin in Bolivia, and with oil in Peru, Colombia, and Venezuela. All this seems to indicate a spree of international borrowing for unsound purposes. In

¹ *Ibid.*, p. 28

contrast with the British foreign portfolio which is made up of only about 25 per cent in government loans, the American portfolio shows about two-thirds in government loans. In the years 1920-1927 British foreign investments were made up of stocks or ownership rights in productive enterprises to the extent of 68 per cent, while in United States for the same period only about 6 per cent was of this character. In absolute figures, in the case of the United States, \$517,000,000 were in stocks and \$2,647,000,000 in corporate debts.¹

Defaulted Bonds.—Bonds of national governments and their subdivisions were in default on January 1, 1932, to the extent of \$19,732,501,435 and interest in arrears amounted to \$9,963,564,966. Details are given in the following table.

TABLE 80—GOVERNMENT BONDS IN DEFAULT, JANUARY 1, 1932

Issue	Original amount	Amount outstanding	Interest in arrears
Argentina	\$ 1,984,125	\$ 1,487,800	\$ 178,500
Bolivia	68,400,000	61,103,500	3,974,400
Brazil	552,929,350	469,136,615	71,680,104
Chile	603,144,800	559,099,250	17,165,532
China	356,019,035	327,537,435	170,197,500
Colombia	12,000,000	11,230,000	361,730
Ecuador	17,054,050	14,492,400	12,210,800
Guatemala			368,800 ¹
Yugoslavia	1,250,000	1,003,500	75,250
Latvia	7,308,600	7,303,000	5,305,500
Mexico	738,651,231	629,163,875	497,283,050
Peru	128,371,068	124,175,360	3,955,625
Turkey	413,500,000	372,151,850	15,431,710
United States	95,474,090	95,474,000	297,181,250
Uruguay	6,000,000	5,649,000	197,715
Total	\$ 3,002,086,259	\$ 2,679,007,385	\$1,095,464,966
Russia	18,758,743,500	17,053,494,050	8,868,100,000
Grand total	\$21,760,829,759	\$19,732,501,435	\$9,963,564,966

From report of Max Winkler to Foreign Policy Association, quoted in *Chronicle*, Vol. 134, p. 422

¹ Less \$109,500 on railroad bonds, since paid.

American experience with foreign dollar bonds floated in this country has been mixed in character. On the one hand are the loans of European countries on which, with the exception of Hungary, no default has thus far occurred. It speaks well for both the ability and good faith of European countries that they passed through the international crisis of

¹ See a series of articles by Lawrence Dennis in the *New Republic*, issues of Nov. 19 to Dec. 17, 1930.

1931 without defaulting on their long-term obligations to private investors. This, however, was made possible largely through the moratorium on interallied debts and reparations declared in June of that year and through the "stand-still" agreement with reference to Germany's short-term debts. The experiences of this eventful year would seem to indicate that there is an economic priority of private international long-term debts over short-term and intergovernmental obligations. Indeed this is necessary if the credit structure is not to collapse utterly.

But American experience with the bonds of certain other countries has not been so fortunate. On February 1, 1932, there were \$697,674,300 South American bonds in default. Of this amount, \$454,623,000 were in complete default, and \$243,051,000 in modified default. The latter defaulted on cash payment but made arrangement for payment of interest and sinking-fund instalments in scrip or notes. Aside from these there were \$109,330,000 of Mexican bonds defaulted in 1914, and \$75,000,000 of the Russian Imperial Government which were defaulted with the revolution in 1919. In addition New South Wales defaulted on February 1, 1932, on \$24,074,500 bonds, interest on which, however, has since been met by the Australian Commonwealth. Other national governments represented in the list are Bolivia, Brazil, Chile, Colombia, Peru, and Uruguay, while a number of states and cities in these countries have also defaulted. Argentina alone has no defaults.

Briefly summarized, recent defaults in South America have been occasioned by world-wide economic depression which bears heavily on the raw-material producing countries, as the collapse in the prices of these materials was unprecedented. Political affairs too were upset in most of these countries. Lastly foreign exchange was almost impossible to obtain for payments abroad. In no case has there been bad faith or even the suggestion of repudiation. It has everywhere been a case of inability to pay in foreign currencies. This experience is only the most recent of many in previous times and it shows beyond a doubt that the security of government, as well as private, obligations rests firmly on an economic basis and, as long as ability to pay exists, public obligations, with rare exceptions, will be paid when due. The sanction of this principle lies in the necessity of protecting public credit.

The Burden of National Debts.—In comparison with the burden of debts in the various countries, per capita figures are of little service. This is because of the wide differences in the per capita wealth and income of the respective peoples. The best basis of comparison is found in the total wealth and income statistics compared with national debts. A recent compilation of these data is that of Redmond and Company for 1929; it gives the approximate situation in the countries which have floated dollar bonds in the United States.

TABLE 81—DEBT POSITION OF FOREIGN COUNTRIES, 1929

Country	Estimated national wealth, millions	Wealth per capita	Total national debt (000 omitted)	Debt per capita	Government expenditures *	
					Total	Debt service
United States	\$349,000	\$2,908 0	\$17,467,606	\$145 5	\$3,643,520	\$ 731,764
Canada	25,673	2,770 0	2,296,850	241 3	349,850	128,787
Latin America						
Argentina	15,000	1,408 8	1,052,799	98 9	347,957	85,643
Bolivia	1,500	576 9	78,813	30 3	19,748	6,450
Brazil	16,000	394 6	993,195	24 5	255,536	61,843
Chile	3,624	880 0	428,038	105 8	119,562	30,102
Colombia	5,850	803 2	80,701	11 1	51,125	3,032
Cuba	3,209	878 5	93,443	24 7	83,730	10,419
Dominican Republic			15,000	14 7	19,298	1,041
Ecuador			23,492	11 7	11,688	1,391
Haiti	500	196 0	18,888	7 4	8,196	2,140
Mexico	6,757	440 0	778,377	51 7	163,685	38,077
Peru	2,047	333	124,463	20 2	45,133	8,812
Uruguay	2,608	1,480	223,129	126 6	55,670	16,544
Europe						
Austria	3,412	522 1	358,006	54 8	255,800	23,117
Belgium	10,769	1,357 7	1,502,451	189 4	258,968	108,121
Bulgaria	2,211	391 1	335,243	59 3	53,843	12,938
Czecho-slovakia	9,942	680 8	1,017,795	70 7	312,265	58,772
Denmark	5,360	1,532 7	311,416	89 1	138,513	14,172
Finland	3,024	844 0	88,000	24 6	100,508	12,820
France	58,200	1,420 8	18,300,000	448 7	1,883,842	850,241
Germany	76,500	1,206 2	1,036,456 ¹	16 6	2,104,213	122,569
Greece	2,692	394 4	479,521	70 3	144,490	48,034
Hungary	4,373	513 1	188,442	22 1	104,069	11,496
Italy	21,250	530 9	9,657,398	236 7	1,176,396	153,070
Netherlands	8,260	1,083 1	1,242,805	162 9	330,862	37,196
Norway	3,850	1,197 3	438,196	156 6	106,581	28,961
Poland	14,000	463 4	461,497	15 3	286,308	20,914
Rumania	11,680	654 5	951,458	53 8	233,935	35,478
Sweden	8,802	624 5	486,806	79 9	190,473	27,069
Switzerland	12,545	3,126 9	421,539 ²	105 1	64,117	21,699
United Kingdom	121,068	2,677 7	37,038,493	815 2	4,080,698	1,843,365
Yugoslavia	8,800	671 8	560,437 ²	42 8	180,516	12,118
Far East						
Australia	17,033	2,710 5	2,404,679	382 7	561,224	124,544
China			2,402,642	5 4	634,362	166,466
Dutch East Indies			435,750	8 4	280,293	33,688
Japan	51,017	818 1	2,864,037	45 9	774,580	134,742
New Zealand	4,404	3,029 0	1,233,390	841 4	121,387	47,482

From *World Economic Chart*, Redmond and Company, 1929¹ Exclusive of reparations, present-day value of which is placed at \$5,950,000,000, or \$95 1 per capita² Exclusive of railway debt which is self-supporting The amount outstanding is equivalent to \$131 3 per capita

* Conversion at average rate of exchange for 1928

This table reveals the extent to which the various countries have mortgaged private property and income by their national debts. In general the larger nations of Europe make the worst showing. The

national debt of Italy equals 45 per cent of the national wealth, in France it is 31 per cent, in the United Kingdom, 30 per cent. The South American countries make a far better showing in this respect, Chile's debt is the largest in proportion to wealth, the figure being 12 per cent Mexico shows 11 per cent and Canada 9 per cent. These figures may be compared with those for the United States, which show only 5 per cent. It must be borne in mind that only national debts are here considered. The total public debts, including those of states, provinces, and minor civil divisions, are far greater for all countries. Complete data are not available. The calamitous drop in the prices of commodities and the deflation of capital values greatly increase the burden of all debts.

National Budgets—Prior to the World War, European countries almost universally kept their budgets in balance. Some of the leading countries had worked out scientific budgets far superior to anything found in the United States. Expenditures were accurately forecast and revenues provided accordingly. But for some years following the war not one of the continental countries attempted seriously to reduce expenditures or provide sufficient revenues to avoid deficits. Great Britain alone succeeded in balancing her budget, even though it necessitated borrowing from the banks by taxpayers in many cases to pay taxes. Most of her revenues were raised through income and profits taxes. Indirect consumption undoubtedly would distribute the burden more evenly over all classes of the population and increase the certainty of revenues of all times.

The inability of European governments to balance their budgets resulted largely from expenditures for armaments. Standing armies and navies were at their maximum peace strength in many countries. While taxes in several countries were levied on sales of goods, they were not sufficient to meet expenditures. The governments generally resorted to the banks to provide sufficient money to make up their deficits. The obvious result of this was inflation of currencies which finally led to their revalorization on a basis of only a fraction of their former gold content, in others complete breakdown resulted. This sort of confiscation of investment values must be regarded as a flagrant violation of national faith. It is little better in its consequences than outright repudiation.

The most recent and unparalleled depression has sorely tried the finances of all governments. Huge deficits have been universal, while floating debts have grown apace. In addition to the usual expenditures, relief measures have called for large sums of money which could be raised only through borrowing. The funding of these short-time loans will undoubtedly result in considerable increases in national indebtedness the world over.

These circumstances have created a new situation which must be considered basic in dealing with government finances. In the face of

huge debts, governments can no longer increase revenues by a mere flourish in raising import or excise duties. The dependence upon income taxes for national revenues to supplement already high tariffs and excise taxes has brought the countries face to face with exhaustion in taxing power. Imports have decreased to a fraction of what they formerly were, while taxable income in the higher brackets has slumped beyond the point where it may be regarded as a source of much additional revenue. For the first time in history, governments are confronted with sheer inability to collect sufficient taxes to satisfy their fiscal requirements. The conclusion is inevitable that public debts and expenditures have increased out of all proportion of governments to meet the demands. It suggests also that the traditional principle of good faith as the basis of government credit has been displaced by ability to pay. Recent defaults on government obligations nowhere resulted from bad faith but from sheer inability to pay.

The way out of the morass of debts where they are out of proportion to wealth and income of the people is retrenchment in public expenditures and reduction of the debts themselves through taxes that insure sufficient revenues for the purposes in hand. In this, Great Britain has taken the lead with respect both to curbing expenditures and to increasing taxes. But only a beginning has been made. This program should be continued indefinitely and even more drastic measures than have yet been employed in most countries await satisfactory solution of debt and expenditure problems. Post-war extravagance in public finances must cease if the credit of the governments is to be preserved.

The Balance of Payments and the Exchanges—The immediate cause of defaults in foreign securities lies in the exchanges. The state of the exchanges is the immediate result of the balance of international payments. In the balance sheet of nations, a country's debits and credits are set over against one another. These debits and credits arise through the exchange of commodities and services among the various countries. On the debit side stand imports, services of foreign shipping and insurance, travel in foreign countries, and the like; on the credit side are found exports, shipping and insurance services rendered foreign countries, entertainment of tourists, and the like. The balance of the various items in the long run must be settled through investment or by gold.

A country may economically become a creditor nation; that is, it may invest in the securities of foreign countries, if its credit balances exceed its debit balances. If its nationals purchase securities equal to the credit balance, bankers are thus enabled to settle their international accounts without the transfer of gold. Another method of evening up credit balances is through direct investments abroad by American business enterprises. Still a third possibility is in the purchase by the creditor country of the internal securities of the debtor country. If these expedi-

ents fail, the balance may be settled only by the transfer of gold to the creditor country. In traditional economic theory this sets in motion forces which ultimately correct the unfavorable balance of debtor countries. This is accomplished by the rise in prices in the creditor country due to the inflow of gold and expansion of credit, which in turn leads to a rise in prices and restriction of exports. At the same time the debtor country is passing through the reverse processes of loss of gold, deflation of prices, and increase in its exports. Thus the historical tendency has been to keep the exchange of goods and services in balance.

In recent years the flow of gold has been impeded through a variety of causes and it has not been allowed to work its usual results. Indeed, the avidity with which Americans absorbed foreign securities in the decade following the World War made it unnecessary. Balances were easily settled through the sale of securities in the United States and direct investments abroad by American corporations establishing factories and branches in many foreign countries. As long as these processes continued, American export trade flourished and prosperity prevailed. But American investments abroad began to diminish in 1929 and, in order to lend continued support to our export trade, American international commercial bankers stepped into the breach by lending short-time credits which grew to huge proportions by 1931. These were variously estimated to be in excess of \$10,000,000,000 in that year, an amount which was ten times the pre-war figure. So large were these short-time credits that many countries depended upon them for the maintenance of the soundness of their currencies through the establishment of the gold exchange standard.

The Breakdown of International Credit.—In 1931 international credit broke down over a large portion of the world. The chief cause of this was the large international short-term credits outstanding. With the severe world-wide drop in commodity prices and failure of banking institutions in many countries, more especially in Germany, Austria, and the United States, confidence in the money and credit systems of the respective countries was badly shaken. Germany and central Europe in general were beneficiaries of large amounts of short-term credits, with the loss of confidence in the financial integrity of these countries, doubt was raised as to the ability of England to meet her maturing obligations. This resulted in an international run on England, which ended with the suspension of gold payment by the Bank of England September 20, 1931. Following this came the cataclysmic collapse of the pound in the foreign markets and losses to all holders of English exchange. So hysterical had the financial world become that a similar run on the United States developed during the ensuing month, with the result of a loss of three-quarters of a billion of gold to foreign countries. The run, however, was unsuccessful. The great strength of the Federal Reserve System enabled these

demands to be met with promptness. There followed, however, a severe decline in bond and stock quotations and a further destruction of confidence in the United States. The number of bank failures became still more distressing, while hoarding proceeded on an unprecedented scale with still further weakening of our banking structure.

In the midst of these events Congress deemed it necessary to enact the Glass-Steagall bill, making government bonds available for Federal Reserve note coverage, thus releasing additional large amounts of gold for export, should the occasion call for it. Yet even with this, should European confidence in American financial integrity utterly collapse and holders of American securities abroad choose to dispose of them in the United States and demand the proceeds in gold, America's surplus stock might be exhausted and the wrecking of the American gold standard and credit would result. Such a disintegration of the foundations of civilization was scarcely to be imagined only a few years ago. Its possibility only testifies to the extent of the disjointedness of the world's monetary and financial affairs at the present writing.

In the events briefly recited above may be read the causes of losses on international investments in the United States. The exchanges of all countries which suspended gold payments experienced a sudden collapse in those countries, such as United States and France, which maintained the metal standard. The drop in the exchanges of these countries made it impossible for them to meet interest and sinking-fund obligations on their debts. In conjunction with this were the unfavorable balances of payments. Gold could not be had and the unfavorable exchange rates made the purchase of foreign exchange to meet dollar payments impossible. American bankers, as well as the investing public, may profit by this experience. They have now learned that foreign obligations are dependent for their integrity, first of all, upon the state of international exchanges. It is not sufficient that the debts of the respective governments be modest with respect to the wealth and income of the people. Early in this volume attention was called to the necessity of a sound credit system as a basis of credit. Nowhere has this been more necessary than in the case of foreign securities.

Contractual Features.—The bonds of foreign governments are beyond the reach of law. There are a number of cases in the history of international financial relations where a country has attempted to bring diplomatic pressure to bear upon defaulting governments. Both Great Britain and the United States have gone to these lengths. The Department of State in the United States attempts to keep informed upon conditions in all foreign countries and at times gives advice to bankers when it is sought on contemplated new issues.

Aside from this, American bankers perform the same service in case of default that they do in case of domestic bond issues. They take the

initiative in carrying on negotiations or forming protective committees in the name of the bondholders. Doubtless considerable service has been rendered in times past, as in the case of the defaulted Mexican bonds. By arrangement with the government of Mexico partial settlement has been made through the efforts of the bankers. Other services are now being rendered in connection with South American defaulting countries. Protective committees are primarily designed to protect legal rights, or to bring about any changes in the existing loan contract, as, for instance, reduction in interest or principal. Bankers have carried on extensive negotiations at their own expense in behalf of South American bondholders. Protective committees are reluctantly formed on account of the expense entailed, until it becomes evident that something tangible can be accomplished.

Sinking Funds.—Recent external loans of foreign governments, states, and municipalities floated in the United States generally contain liberal sinking-fund provisions, many of them being sufficient to retire the principal at maturity. While these bonds are generally sold from seven or eight points below par to par at the time of issue, the sinking funds provide for purchase in the open market at or below par. If bonds are unobtainable at these prices, sinking funds are sometimes made to accumulate until a period of 10 years has passed, when the bonds become callable, usually by lot, at a definite figure anywhere up to 115, or revert back to the government. Monthly instalments to be made with the country's fiscal agent in the United States or with an American bank for the payment of interest and sinking-fund requirements are sometimes required. Interest and sinking-fund charges, in the case of countries whose credit is weak, are made a prior or equal charge with all other obligations issued in the future upon either general or special revenues. The pledging of revenues thus becomes a support to an obligation which is in need of greater strength. In the case of Santo Domingo and Haiti, the governments of those countries have made treaties with the United States providing for the appointment of a receiver and adviser, upon the nomination of the United States, for the assurance of the safe handling of the revenues. This furnishes additional strength to the bonds of those countries.

Pledged Revenues.—The practice of pledging special revenues as security for government loans is very old. England employed it in the eighteenth century. It is very general at the present time. Germany, Hungary, Portugal, Poland, Bulgaria, Austria, and other European countries have employed this expedient, all of the Central and South American and Far Eastern countries, except Chile, Mexico, Cuba, China, and Japan, have also recently used the same means to secure their debts. The loan agreement sets forth carefully the procedure in case the clause is to be invoked. Collection of revenues is usually made in case of default

by the trustee of the loan. In the case of Central American countries these agreements are registered with the State Department of the United States Government which lends its protection and cooperates in the financing.

But sovereign governments do not always respect these agreements and there is no power which can control their action. Pledged revenues are sometimes appropriated, as in the case of Turkey in 1928. In such cases usually a redrawing of the loan contract is in order, involving suspension of the sinking fund for a period of years, reduction of interest charges, and funding of due and unpaid coupons through the issue of new bonds. A collecting bureau or fiscal agency of the trustee is set up to collect the pledged revenues for the old and new bond issues. Such arrangements for foreign financial control have proved successful in the case of Turkey, Greece, China, Persia, Tunis, Salvador, Venezuela, Liberia, and Haiti. In the case of Greece the old bondholders received about 50 per cent of the interest. The same method of collection has proved unavailing in the past in case of Honduras, Mexico, Portugal, Paraguay, Bahia, Brazil, Guatemala, Egypt, and Constantinople. When additional revenues are required to make up deficits in budgets, pledged revenue provisions fail the bondholders. It appears that pledged revenues do not give the security indicated by their terms of contract. Securities of this type frequently fare no better than unsecured debts. Pledged revenues in the case of Ecuador and Brazil, however, in times past have created a priority for securities over those of second claim on the identical revenues. But in other cases no priority was created over unsecured bondholders.¹

Market.—The market for foreign bonds in the United States has been mostly among the general public. The coupon rates and yields have been considerably higher than those of domestic bonds and this has proved a deciding factor with the public. A calculation made by Dwight W. Morrow,² based on actual sales of 24 representative investment houses embracing 25 per cent of recent loans aggregating \$380,000,000, indicates that more than 85 per cent of the purchasers bought in small amounts ranging from \$100 to \$5,000 and that about 50 per cent of the total was purchased by these small investors.³

Price and Yield.—Foreign issues floated in the United States have carried coupon rates ranging from 6 per cent, for the countries of better credit, to 8 per cent for those of weaker credit. Bonds of Switzerland, Belgium, Norway, Czechoslovakia, France, and the South American countries, including state and municipal obligations, bore coupons of 8

¹ See article by George F. McCabe in *The Annalist*, Jan. 20, 1928.

² In *Foreign Affairs*, January, 1927.

³ The issues upon which this calculation is based were the Austrian 7s of 1923, the Japanese 6½s of 1924, the German 7s of 1924, the Argentine 6s of 1925, and the Belgian 7s of 1925.

per cent. Many of these bonds also carried a callable feature, optional within 10 or 15 years, with a premium of 5 to 15 per cent. The average coupon rate for outstanding Latin American government, state, municipal, and guaranteed mortgage-bank bonds at the end of each year, beginning with 1922, gradually declined from 6.92 to 6.29 per cent in 1930. This was due, first, to retirement through sinking funds or refunding of higher coupon issues of the earlier years and, second, to the lower coupon rates of later years.¹

The weighted average yield on quoted outstanding Latin American public bonds (including government guaranteed issues) at the end of 1923 was 7.60 per cent. This was gradually reduced to 6.55 per cent at the end of 1928, in 1929 and 1930 the yield increased, standing at 10.81 per cent at the end of 1930. During the decade 1921-1930 the average weighted price of these issues varied from 91.95 at the end of 1923 to 98.77 at the end of 1927. After that the price rapidly declined to 68.66 at the end of 1930. Even before the crash in the stock market in 1929, Bolivian issues suffered from the effect of the dispute with Paraguay, while uncertain economic conditions in Colombia affected the price of its bonds. In Brazil difficulties with coffee first affected the price of its bonds. In December the *Caja de Conversion* in Argentina was closed to note redemption. Accompanying these events in the latter part of 1929, the bonds of other Latin American countries declined in sympathy. The economic and political troubles during 1930 and 1931 resulted in further drastic declines in these issues.² Before the depression the yield on government and guaranteed mortgage-bank bonds was about 1 per cent lower than that of state and municipal issues. But the spread at the end of 1930 increased to almost 3 per cent.³ During the severest phase of the depression in 1932, the prices of Latin American bonds sank to disheartening depths. The bonds of Chile and Brazil sold as low as 3½, those of Bolivia 3¼, Peru 3. Even the bonds of Argentina, upon which no default occurred, reached the low figure of 37½, those of Cuba 33, Sao Paulo 46, and Panama 45.

The bonds of certain European countries also had a poor record during the depression in 1932. The defaulted Hungarian issue of 1944 sold at 20. Undefaulted bonds of Bulgaria sold down to 11, those of Budapest 11½, Berlin 16, Austria 20, Greece 12½, Prussia 15½, Vienna 32, and Germany (7s of 1949) 41¾.

On the other hand, prior to the European financial crisis of 1931, 25 or more foreign bond issues sold at a substantial advance over the issue price. In 1932 all of these, except French issues, sold below their issue price.

¹ See article by Adam K. Geiger in *Chronicle*, Vol. 132, p. 2073.

² *Ibid.*, p. 2273.

³ *Ibid.*, p. 2274.

The influence of the exchange rates of foreign currencies upon the price of foreign bonds deserves especial consideration. The prices of bonds whose interest and principal are payable in foreign currencies vary directly with the price of foreign currencies in dollars. Large losses were sustained by holders of obligations of countries whose currencies depreciated in terms of dollars. But bonds payable in dollars are immune from fluctuations in exchange rates, since the promise is to pay dollars; losses due to depreciated currencies must be borne by the debtor countries. This conclusion holds as long as no question is raised concerning the ability of the debtor to meet his obligations. But when doubt is raised in regard to this, the price of dollar bonds suffers as their quality deteriorates. This was the situation during the depression with the bonds of almost all foreign countries, and prices declined accordingly. A number of American companies operating in foreign countries which showed ample earnings to pay interest on bonds held in the United States were compelled to default on interest payments on account of currency difficulties.

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PART V
SECURITY PRICE MOVEMENTS

CHAPTER XXXVI

Law of Supply and Demand.—The fundamental law of supply and demand must be invoked in the explanation of all security price movements. When prices are steady, the forces of supply and demand are in comparative balance. As long as nothing disturbs this balance, there is no force that can change prices. But the moment a change occurs in any of the various forces that make up the total of supply and demand, there follows a corresponding change, unless this underlying force is offset by an opposite force of equal strength. This is easily the most inflexible law in the entire realm of economics. Once it is appreciated that the law of supply and demand constitutes the all-pervading mechanism of the market, price changes lose most of their inscrutable character.

In the application of the law of supply and demand to security prices, it presents itself in two ways. First, there are general forces at work which equally affect the total amount of investment funds available for the market during a given period of time. Such are alternating waves of expansion and retrenchment in personal expenditures, the development of the habit of thrift among the common people, changes in business conditions as reflected in greater or lesser profits, changes in the supply of money, changes in currency, and in banking conditions, and changes in labor policies, international trade, taxation, and the like. On the side of demand come changes of rapid industrial development, extraordinary expenditures of money for war or preparation for war, the foreign demand for funds, and other similar forces, all of which tend to alter the conditions of demand. The interaction of these forces is exceedingly complex and their interrelationship is so difficult to discover that one might at first sight well despair of any accurate calculation. Yet it is the final result wrung from this apparently chaotic mass of forces that is the deciding factor in the general movement of security prices. Whenever the forces of supply of investment funds exert their influence on current markets in greater strength than the forces of demand, prices will fall; on the other hand, when the forces of supply gain the ascendancy, prices will rise. Prices will move upward or downward until the strength of the forces of demand and supply is brought into equilibrium.

Since all security prices are more or less affected by the operation of these forces, they are not equally affected. If an increased supply of funds comes into the possession of those speculatively inclined, securities that offer the greatest chance for profit will be most affected. Like-

wise, if a particular kind of security comes to market in exceptionally large amounts, its price will be unfavorably affected. The final result will always depend upon conditions governing the supply of funds on the one hand and the supply of securities on the other.

The second application of the law of supply and demand has to do not with the supply of and demand for funds in their totality, but with the shifting of funds from one investment field to another. As already made plain, underlying forces are constantly at work attracting capital to some fields and repelling it from others. The shifting of investment funds is one of the subtlest of influences affecting security prices and, therefore, one of the most elusive to follow. That shifting is most effective in altering the prices of whole classes of securities, as well as individual issues, can be easily proved by a comparison of the averages. The Dow-Jones index numbers show that the average of 20 representative railroad stocks declined from 92.91 on November 9, 1918, to 82.48 on October 6, 1919. On the other hand, there was an opposite movement of great magnitude in industrial stocks. The average of 20 representative industrial stocks rose from 89.07 on October 18, 1918, to 119.62 on November 3, 1919. Thus the shift of investment funds from railroad to industrial stocks, in the year following the armistice, is most impressive and shows the vital consequences of such movements for the investor.

Changes in Supply of Securities.—The operation of the law of supply and demand may be compared to the maneuvers of two opposing armies. First, there are the most advanced lines on both sides which come into contact with each other and to which the actual fighting is confined. Then come the immediate reserves back of the fighting lines, ready to be called into action at any time the occasion demands their assistance. More remote are the training camps for recruits and, lastly, the civil population standing in readiness to answer the call to the colors.

So it is with the security market. Of the vast amount of stocks and bonds outstanding, only a comparatively small portion is brought to market at any one time. To this portion is added the volume of current flotations and short sales to make up what may be called the "floating supply." Upon this floating supply attention is focused in an inquiry as to the causes of price movements. Without the pale of the market is found a vast amount of securities held by individuals and institutions which constitute the financial reserves. From these reserves large amounts of the floating supply are obtained and they command an importance in price movements comparable to their quantitative importance. Still farther back from the floating supply will be found securities which can be called upon in case of extraordinary emergency. These are indeed locked away, but the key is ever at hand in case the need arises. Lastly come those issues "salted away" in the *sanctum sanctorum* which represent funds stored away for the future to be used only in the unfolding of a

predetermined program. They are the retirement and old-age funds of individuals and insurance and annuity funds. This latter class seldom comes to market and, if it does, only in an orderly fashion without any unusual disturbance to prices. All four classes here distinguished constitute the complete supply of securities comparable to the economists' "stock of goods" on hand.

The floating supply of securities is very flexible in character and subject to wide and sudden changes. In this respect it differs from the supply of commodities, which is constantly being consumed and which can be increased only to the extent of the current productive capacity of industry, decreases come about only through the orderly processes of the market. Hence the market shows wider swings in the prices of securities than in the prices of commodities. This may be confirmed by measurement with the statistician's device of standard deviation. Business cycles reflect much more radical movements in security prices and interest rates than in commodity prices.

An outstanding illustration of excessive supply is the dumping on the New York Stock Exchange at the outbreak of the World War in August, 1914, of American securities previously purchased and held by investors in belligerent countries. So great was the avalanche and so rapidly did prices crumble away that the Board of Governors in an effort to stem the tide closed the exchange to all transactions for more than 4 months. Even for 2 years after the reopening, foreign-held American securities continued to be liquidated in large amounts in New York, depressing further and further the quoted prices.

The floating supply of securities is periodically increased during periods of great prosperity and speculation when profits are large. The expansion of old plants and launching of new promotions go on at a feverish pace, with the result that the market is flooded with a volume of securities to finance the new undertakings. This creates an exceptionally large temporary supply of stocks and bonds, and prices are depressed for several years afterwards. Such a period was the period of "undigested securities" following the major cycle of promotions around 1900. On this account the panic of 1903 has been called the rich man's panic.

A recent instance of excessive marketing of securities followed the announcement of the abandonment of the gold standard by Great Britain September 29, 1931. This step by the world's traditional stronghold of the gold standard, coming as it did while the entire world was struggling in the midst of the severest business depression of recent times, utterly destroyed the last vestige of confidence in the stock market and also greatly imperilled the future of the bond market. The precipitous drop in the bond market during the following month has no known precedent in history. While this was occasioned perhaps more from thinness of demand than from dumping of bonds by holders, it is, nevertheless, true

that volume greatly increased during these weeks and greatly accelerated the decline. Heavy selling of bonds continued to the end of the year, presumably by holders who bought at prices much higher than current prices whose average descended to 1921 levels. For specific groups the decline was far more severe, as for instance in second-rate railroad bonds and in a large number of foreign issues.

National Income and Savings.—When one turns to the demand side of the price equation, national income and savings appear fundamental in their effect for the longer periods of price movements. Dr W. I. King has computed for the National Bureau of Economic Research the individual income of the people of the United States for each of the years in the interval 1909–1928. This is computed in terms of current dollar income, after adjustment for changing purchasing power, using 1913 as the base

TABLE 82 —REALIZED INCOME IN THE UNITED STATES
(000,000 omitted)

Year	In current dollars	In 1913 dollars	Year	In current dollars	In 1913 dollars
1909	\$29,605	\$31,300	1919	\$65,949	\$38,017
1910	31,430	32,380	1920	73,999	37,573
1911	31,858	32,920	1921	63,371	36,710
1912	33,977	34,656	1922	65,925	40,565
1913	35,723	35,756	1923	74,337	45,164
1914	35,647	35,250	1924	77,135	46,758
1915	37,205	36,636	1925	81,931	48,412
1916	43,288	39,559	1926	85,548 ¹	50,421 ¹
1917	51,331	40,242	1927	88,205 ¹	52,892 ¹
1918	60,408	40,150	1928	89,419 ¹	54,022 ¹

From W. I. King, *The National Income and Its Purchasing Power*, pp. 74, 77

¹ Preliminary estimate

Current money income more than doubled in the interval 1914–1920, yet the deflated figures show only a small increase, less than 10 per cent. On the other hand, the period 1920–1928 shows income in current dollars increased by only 20 per cent, while real or deflated income rose 44 per cent. The great rise in real income since 1920 will be significant at a later stage in explaining in part the movement in security prices during this interval.

Of the total national income in the United States Dr. King estimates that about one-seventh is saved. This does not seem to vary much from year to year regardless of the state of business. Of the total savings in the period 1909–1918 Dr. King attributes 20 per cent to employees, 12 per cent to the agricultural interests, and 68 per cent to business men and property owners outside of agriculture. Moreover, 40 per cent of all saving is the result of profits retained by business enterprises. The latter vary directly with business activity, while private savings are

much more constant from year to year¹ The savings of business concerns are only of indirect interest in this discussion, since for the most part they are reinvested in the assets of the business One should not neglect, however, the temporary or permanent investments of business enterprises in stocks and bonds, although they represent only a minor fraction of the total savings of business concerns, which for the most part do not find their way into the financial markets and are thus without any direct influence on price movements

Bank Credit.—The condition of bank credit has a profound influence upon security prices This is true whether the matter is viewed from the short-time or the long-time standpoint It is, moreover, equally true whether one has in mind bond prices or stock prices Yet it is not true that this is the controlling factor at all times The tendency to overemphasize the influence of credit conditions is due in no small degree to the frequency of changes in banking conditions, which do generally find their reflection in price movements Perhaps this factor is entitled to first place in the field of bonds but it may well take second place to earnings in the prices of corporation stocks Moreover, the old adage of Wall Street that no bull market was ever financed without ample banking funds available can hardly be substantiated in view of the experience of the past 10 years

What is the precise nature of the influence of bank credit upon security prices? The solution of this is to be found by pursuing analysis along the lines of supply and demand From the point of view of the entire banking system, bank credit, that is, deposits and loans, is almost entirely the creation of the system itself Liquidity in banking depends upon the maintenance of adequate money reserves The amount of these is determined in European countries by experience and in the United States by law In the United States bank credit can no longer be expanded when legal reserve requirements against deposits are exhausted.

But banks do not expand credit normally except when demand for loans appears Demand is encouraged by concessions in the interest rate when excess reserves become large But in the absence of favorable business or financial conditions this stimulant is without results. Maladjustments in price relationships involving raw materials as against manufactured products, wages as against profits, in short, cost *versus* selling price, inevitably prolong business depressions regardless of cheap money. This situation was amply illustrated during the depression of 1930–1931. Much less will easy credit conditions and low interest rates stimulate buying of stocks or bonds when earnings continue to decline or when confidence is destroyed, as the recent experience has again so well illustrated. The true function of easy banking conditions is to provide

¹ W I KING, *Journal of the American Statistical Association*, September and December, 1922

freedom of action and nothing more. But freedom of action fails to work its effect on an unwilling subject. Easy credit is essential to a revival of business activity and security prices but only in a permissive sense.¹ The functions of credit may be compared to the stage upon which the actors are to appear. The stage is but the scene of action while the actors themselves must play the active roles. In the world of business and finance, the managers of business and investors are the actors who must at all times enact the parts in the drama.

It is, nevertheless, true that the end of a period of business expansion and of rising security prices is usually encountered when credit conditions become tight. The situation is now reversed. Restriction of credit damps the enthusiasm of business leaders and capitalists. The condition essential for their continued activity has changed. Higher prices call for more and more banking funds to finance operations. When these funds reach exhaustion, higher prices are no longer possible. This is, of course, on the assumption that private funds have for some time already been utilized and that the later stages of price advance have been financed out of bank loans. One is not unmindful here of the experiences of 1928 and 1929 when the exhaustion of banking funds for speculative purposes did not represent the end of credit expansibility. The loans of corporations, investment trusts, and the like, financed the bull market during those years far beyond the point where banking funds would naturally have been so scarce that further advances in prices would have been impossible. The control of credit had passed entirely from the banks.

It should be observed in this connection also that the availability of credit at any price is the important factor in stock speculation, rather than the rate of interest, as frequently claimed. But interest rates do have their effect. When money is borrowed at a rate of interest below the dividend yield on the stocks purchased on the margin, the possibility of profit is eliminated. This is true as far as the banking profit is concerned. But it is only the beginning of the story; the end is speculative profits. Speculation seeks changes in prices, not a differential in income. A gross profit of \$5 per share on a stock bought at \$100 and held for a month is at the annual rate of 60 per cent. This is but a modest expectation of the speculator. It is therefore entirely unreasonable to assume that a rate of interest even as high as 10 per cent has appreciable restrictive influence upon the activity of the speculator. To him the possibility of increase or decrease in price is the absorbing factor. But even the speculator will bargain for cheap money which will increase to some extent his final profits.

¹ The author regards the position taken by Wesley C. Mitchell in his work *Business Cycles, the Problem and Its Setting* as sound not only in the relation of easy credit to business activity, but also especially applicable to the security markets (see pp. 128-139).

The Bank Rate of Interest and Bond Prices.—A closer relation is found between bond prices and bank interest rate than between the latter and stock prices. This closer relationship comes, first, from the fact that liquid investment funds always follow the direction of greatest return. Now the bank interest rate is closely related to the rate on commercial paper of all kinds and all short-time notes and maturities. Private investment funds seeking employment are placed where they will bring in the largest yield. Thus the relation between short-time interest rates and bond yields determines to a large extent the flow of current investment funds of a private nature. When bond yields are relatively high, they attract larger and larger amounts of funds, until the price is forced high enough so that the differential disappears. Yet the banks themselves stand ready at all times to supply business with credit, even if they find it necessary to call upon their secondary reserves, in which case bonds will be sold to meet the requirements of business. It generally happens too that the bank rate of interest is higher than the yield on first-class bonds and the banks are glad to sell the latter for the opportunity of securing a higher rate of return. Moreover, in ordinary times they seek to keep as large a portion of their funds as possible employed, so that in times of slack demand for their funds they enter the bond market. This constant shifting of funds into and out of the investment market by banks exercises a continuous influence on bond prices and yields. It will be found to be one of the important short-time influences in the bond market.

Gold and Credit.—Under a gold-standard system of money and credit, the chief domestic function of gold is to serve as a reserve for credit. Comparatively little gold is found in actual hand-to-hand circulation. It remains in the coffers of banks for the maintenance of a liquid condition at all times. Thus gold is the foundation of the entire credit system and guarantees the redemption at all times of the currency in circulation.

The second important modern use of gold is in the payments of balances between countries. All countries having gold as the standard and conducting commercial relations among one another equate their currencies in terms of the weight of gold. Gold thereby becomes the common measure, or common denominator, of value in the world at large. The breakdown of international credit in 1931 was the result of a series of international runs on the central banks of Germany and of England, forcing the latter country to suspend gold payments entirely, except at the will of the government. Confidence of the world in international credit was completely upset through these events. The failure of the international run upon the Federal Reserve System, following the failure of the English pound in September, 1931, went a long way toward reestablishing confidence throughout the world.

In its function as a reserve for the credit system, gold acts as restraint upon the undue expansion of credit by banks. As long as money and credit systems are anchored to the gold standard, expansion can proceed only so far as not to exceed safe standards of redeemability established either by law or by custom. This is the foundation of enduring confidence in a currency system. Without the restraining influence of gold, experience the world over during several centuries of time shows conclusively that no currency system is safe against the baneful effects of inflation. When temptation comes through emergency conditions, public authorities do not possess the power of restraint sufficiently to avoid inflation and depreciation of the monetary unit. With depreciation of the monetary unit goes depreciation in all investments measured in the same currency unit. No greater anchor to investment security is found anywhere than in the stability of the currency system.

The restatement of these fundamental monetary facts shows that even under a sound system of money a large increase in the supply of gold lays the foundation for multiplied increases in the amount of credit at the banks. The banks are the natural depositaries of the gold holdings of a country, the chief exception in the United States being the gold held by the federal treasury against gold certificates and the redemption funds of national and Federal Reserve bank notes. Increase in the gold supply increases bank reserves and tends to make credit conditions easier and bank interest rates lower and these conditions in turn clear the way for advances in business and security prices. It matters not from what source new gold comes, the result is the same. The two chief sources for fluctuations in the gold supply of a country are the domestic production of the metal and importations from abroad. At this point the theory of international gold movements may be recalled. A country balances its exports of goods and services against imports of goods and services and, in the absence of restraining forces, gold flows in the direction of the credit balance. This was formerly the only method known of settling international balances. But the matter is not quite so simple in the modern world of finance. The excess debit balance of a given country may be settled by the creditor country's taking securities of the debtor country. Creditor countries thus are permitted to enter the field of international investment and the gold remains in the debtor country.

The third situation affecting the flow of gold is where a surplus of funds exists in a given country and seeks investment abroad. These funds may be transferred only through the shipment of gold to the country in which the investments are made. In estimating the future supply of gold for a given country, it is then necessary to base calculations upon domestic production, the international flow of gold to settle balances, and the investment flow of gold. These movements have reached vast proportions since the World War. In pre-war days gold seldom left a

given country in sizable amounts except to settle balances of payments. In the present situation of sensitive international finance it is doubtful if gold will soon or ever return to its former lethargic state. The security holder thus has one more factor of major importance to watch in his investment program.

The Federal Reserve Banks and Credit.—In these days when so much is heard of the sterilization of gold by the Federal Reserve System, one is likely to conclude that gold had lost its chief function in the monetary system. While this is not wholly true, gold has lost some of its restrictive power over credit through the Federal Reserve System. This results partly from the law which requires 35 per cent reserve against deposits and 40 per cent against the notes of the system. Member banks of the system are required to keep their reserves with the system. The reserve banks thus receive additional supplies of gold from member banks as reserves against their own deposits. This gold then becomes the basis of Federal Reserve deposits and notes and makes it possible for member banks to borrow at the reserve banks in amounts larger than their reserves by rediscounting eligible paper, the proceeds of which in turn are left on deposit as reserve against which commercial banks further extend their own credit. The amount of borrowing is controlled by the reserve banks through the rediscount rate charged the borrowing banks. Here as elsewhere high discount rates discourage and low rates encourage borrowing, member bank credit is thus artificially controlled. If the system deems it expedient that large excess reserves should be held by the reserve banks, as has usually been the case, borrowing is discouraged and the gold which might otherwise have served as a basis of increased member bank reserves and increased loans and deposits of reserve banks is "sterilized." Federal Reserve rediscount policy in this way becomes another important factor in the course of credit.

A second instrument for the control of credit by the reserve banks is found in their open-market operations. By this is meant the buying and selling of eligible paper in the open market. This has become more and more a tool in the hands of the reserve system to facilitate credit operations of member banks. Reserve banks may relieve the money market of paper by purchasing large amounts of this type of paper on their own initiative or that of member banks themselves. Or they may choose to sell the same paper in the market and either directly or indirectly absorb idle banking funds. The reserve banks made large use of this during the past decade as a means of controlling bank credit. The weekly reports of the reserve banks offer ample opportunity to observe the open-market operations of the system. This power of the reserve banks has been the hope of those who subscribe to the theory that business may be quickened merely through the increase of idle credit. The limitations of this position have been pointed out above.

It must be observed, however, that the control of credit by the reserve banks has distinct limitations. It was said that member banks may and do in practice increase their reserves upon the receipt of new gold. There is no power within the reserve system to refuse these deposits and no known means of restricting their influence upon credit in times of expanding business when borrowers are numerous. Much of the credit expansion of the great security and real-estate inflation of the past decade was achieved in this way and the reserve banks were powerless to prevent it. The rediscount rate was impotent, since no borrowers appeared at the banks for funds and the reserve banks possessed no large amounts of paper which could be sold in the open market to absorb the excess credit of member banks. Besides, they did not consider it expedient to part with what paper they had, since such a move would have left them without earning assets sufficient to pay the expenses of running the system.

Commodity Prices and Interest Rates.—For more than a century it has been observed that there is a close connection between the prices of commodities and the prices of bonds having a fixed or stable rate of return. Writers have generally shown that when commodity prices advance bond prices decline, and when commodity prices decline bond prices advance. Treatises on this subject have been disguised under various names. More recently, the most extended discussions have considered the problem from the point of view of a monetary phenomenon. A rising commodity-price index represents a depreciating standard of money; and, conversely, a falling index represents an appreciating standard of value. Furthermore, for various reasons, recent treatises have also spoken of a rising or falling interest rate, instead of falling or rising security prices, respectively.

The problem of interest has two fundamental aspects, the one purely economic and the other monetary or financial. The one has to do with underlying economic values and the other with the expression of those values in terms of money. A simple example will bring out the two aspects of the problem. If \$100 is loaned for 1 year at 4 per cent interest, 1 year hence the principal will be returned to the lender and in addition \$4 interest, or \$104 in all. Now if commodity prices in the meantime have remained the same, the amount of the interest is a clear gain, in purchasing power, for \$104 will purchase 4 per cent more goods than \$100. The expectation of the lender has been fully met and all is well. Suppose, however, that in the meantime, commodity prices have advanced 1 per cent. It now takes \$101 to purchase what \$100 would have purchased a year ago. In other words, out of the \$4 interest which was received on the money loaned there are only \$3 left. Moreover, the \$3 has also lost in purchasing power in the same proportion. Since commodity prices have advanced 1 per cent at the end of the year money is worth

only a little over 99 per cent ($99\frac{1}{100}$ per cent to be exact) of what it was when the loan was made. Ninety-nine and one-eleventh per cent of \$3, the amount of money interest above what was necessary to make good the principal, gives $\$2\ 97\frac{3}{100}$ as equivalent real or commodity interest, which is an equal percentage on the original money loaned figured in terms of commodities. The conclusion is, therefore, that while money interest was \$4, or 4 per cent, real or commodity interest amounted to only $\$2\ 97\frac{3}{100}$, or $2\ 97\frac{3}{100}$ per cent.

This discrepancy between commodity and money interest would be manifest during periods of rising prices, and the opposite effect in periods of falling prices. It is due to the change, appreciation or depreciation, in the money standard. It is of basic importance in the explanation of the relation of commodity prices to security prices, or, to state it in other terms, between interest rates and the value of the standard medium of exchange. Will lenders of money take advantage of the situation or will they possess foresight enough to avoid losses in periods of rising prices? If so, their action may result in higher money rates of interest in order to preserve the full commodity rate intact. Or do these periods of rising prices steal upon the investor unawares, resulting in corresponding losses in interest as measured in commodities? In order to answer these questions, Prof. Irving Fisher has made extended investigations. The main facts as he found them are here recounted.¹

The period 1826-1906 has been divided for England into 16 separate movements for commodity prices, averaging 5 years each. In comparing one period with the next, it was found that when the rate of interest, both bank and market, falls, money usually appreciates in value, which is the same as falling commodity prices, and when the rate of interest rises, money usually depreciates in value or commodity prices rise. For Germany (Berlin rates) the period 1851-1905 is divided into 13 periods, averaging a little less than 5 years each. For France (Paris rates) the period 1861-1895 was examined, being divided into 7 periods, averaging a little less than 5 years each. For the United States, New York call loans and commercial loans for 60 days are compared with the changing value of money. The period 1849-1906 was examined, being divided into periods of $6\frac{1}{3}$ years each on the average. Data were also collected for India, China, and Japan. If two successive phases be designated as a sequence, and if the price change be compared with the data for each kind of interest rate, the number of sequences totals 90. The results are summarized in Table 83.

The favorable cases preponderate and Professor Fisher concludes that, other things being equal, "the rate of interest is relatively high when prices are rising and relatively low when prices are falling."

¹ IRVING FISHER, *Appreciation and Interest*

The adjustment between money interest rates and commodity interest rates, however, is only partially made. When the actual interest rate is reduced to the commodity rate for the various periods in Professor

TABLE 83—COMMODITY AND MONEY INTEREST IN LEADING COUNTRIES

Condition	Eng- land	Ger- many	France	United States	India	Japan	China	Total
Favorable	23	15	8	8	3	6	1	64
Unfavorable	7	5	2	2	1	4	1	22
Neutral	0	2	0	2	0	0	0	4
Total	30	22	10	12	4	10	2	90

Fisher's tables, it is found that the commodity rate of interest varies widely. For instance, in the case of London the average commodity rate of interest from 1836 to 1839 was only 1.9 per cent, while in the period 1840-1844 it was 9.4 per cent, likewise, from 1871 to 1873, the commodity rate was minus 2.5 per cent, and in the following period 1874-1879, it was 7 per cent. The period 1897-1900 shows a rate of minus 4 per cent, and the period 1901-1906 shows 1.6 per cent. The figures for London show a maximum variation in the commodity interest rate of 13.4 per cent. In several other countries where similar calculations were made, variations fully as striking are in evidence.

On the other hand, the maximum figure for money interest in England during the entire period shows only 3.8 per cent variation in the averages for the respective periods. Similar results are found in the case of other countries. The fluctuating character of the commodity rate of interest in comparison with the comparative stability in the money rate, goes to show that in practice lenders at most make only minor adjustments for monetary changes. Foresight or ability is lacking. "When prices are rising, the rate of interest is usually high, but not as high as it should be to compensate for the rise; and when prices are falling, the rate of interest is usually low, but not as low as it should be to compensate for the fall." Since security prices are the reverse of interest rates, one concludes, therefore, that although there may be an underlying tendency toward the adjustment of security prices to offset commodity prices, nevertheless, it is too feeble in practice to take much cognizance of. On the contrary, the prices of securities with fixed income vary in the opposite direction from the movements in commodity prices mainly for reasons other than conscious foresight and calculation.

Professor Fisher also made calculations for longer periods running from 10 to 20 years. It was again found that the adjustments worked out only partially for the longer periods. In the case of New York City, the average virtual, or commodity, rate of interest for the period 1875-

1896, a period of falling prices, was 77 per cent, while for the period 1897-1906 it was only 11 per cent. The results thus show a woeful lack of foresight and ability to "play even", this is true on the part of the investor and business man alike over both short and long periods of time. It is very doubtful if there is a universal conscious attempt at readjustment of interest rates to commodity prices. It is more likely that the phenomenon results from certain fundamental economic forces set in motion in periods of rising and falling prices, which in turn influence the demand for and supply of money and securities and so have their effect on the interest rate and security prices. Moreover, the assumption that the yield on securities shows parallel or similar changes in the banking rates of interest may be seriously questioned in certain cases. The banking rates of interest in New York, from the early seventies down to the present time, have shown a steady downward tendency. The yield on securities, on the other hand, shows a decline down to 1901 and from that time till 1920 a steady and pronounced increase.

Bond Prices and Commodity Prices.—There is a dynamic connection between bond prices and commodity prices. A period of rising commodity prices always means a period of greater demand for funds for both consumption and investment purposes. The rise in prices of consumption goods almost always precedes the rise in prices of capital goods. This in itself tends to deplete the funds ordinarily set aside for investment and thereby lessens the supply of available funds for this purpose. When the prices of consumption goods rise, profits increase and production is stimulated, in order to take advantage of the higher prices of these goods, before the prices of capital goods and raw materials advance. This calls for an extraordinary amount of investment funds from individuals and credit from banking institutions. There is thus a tendency to decrease the supply of funds at the same time that there is a tendency to increase the demand. Only one result can take place, and that is a falling security market and higher yields on new offerings, called the current rate of interest.

As has been brought out in another connection, there is no doubt, also, that periods of rising prices are periods of personal, business, and governmental extravagance. Rising prices give the appearance, and also the feeling, of prosperity which no doubt have a basis in fact. There is nothing that succeeds like success and advancing profits no doubt stimulate business men to their best efforts. Greater profits lead to progressively greater extravagance, with the result that the source of investment funds tends to dry up. This is hastened by the tendency of profits to disappear through rising costs. Debts accumulate toward the end of the period of rising prices and these have to be paid. Banks are reimbursed for their loans through the sale of stocks and bonds to the public at exorbitant interest rates. The period of rising prices thus

becomes a period of constantly decreasing supply of capital funds. On the other hand, the tendency to dispose of bonds and other income-bearing securities is present in order to secure funds to meet the greater demands occasioned by higher prices. The floating supply of securities thus increases at the same time that the supply of funds decreases. The equilibrium of the market is disestablished, and prices move in an effort to restore the balance.

The matter should be viewed from still another angle. Periods of rising prices bring the necessity of greater income for personal needs. A widespread tendency to shift investments appears. Safety is sacrificed in favor of larger income. Second-rate bonds are bought and gilt-edged issues go begging, debenture issues are overthrown and preferred or common stocks purchased with the hope of augmenting incomes. The result in the market is that bonds decline, while stocks increase in price. The interest rate is then said to rise. All this has taken place without any conscious effort on the part of lenders to exact from borrowers or former holders larger incomes or lower prices in an effort to eke out a living. The process is dynamic and inherent in the forces in the general economic situation.

During periods of declining commodity prices the reverse takes place. Profits of industry tend to decline and losses threaten the stockholders and debenture bondholders. A movement develops toward retrenchment, thrift, and general setting of the financial house in order. Gilt-edged bonds are demanded in large amounts and the floating supply of second- and third-grade issues swells, while the demand for these classes steadily falls off. Only one result may be predicted, namely, falling prices in the latter issues. Dynamic forces again have worked themselves out in the security markets.

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CHAPTER XXXVII

BUSINESS FLUCTUATIONS

Value versus Price.—In the general science of economics, which deals almost entirely with commodities and services, the term "price" is simply the monetary expression of the term "value" or "value in exchange." In finance, however, a distinction has long been made between value and price. Value here refers to the more or less permanent worth of a security, while price relates to market quotations or "value in exchange" of the economist. In order to emphasize the distinction between value and price, the former is often spoken of as "intrinsic value." In so far as any definite meaning can be attached to the term intrinsic value, however, it would seem to refer to the mathematical or statistical value discussed in Chap. VII. If one recalls that the fundamental principle in statistical value is the discounted value of future payments, one has an unassailable basis for the distinction between value and price recognized in the literature of finance.

Dynamic Economic Forces.—With the conception of statistical value in mind one may proceed with the inquiry into the fundamental causes of price changes in the market. One deals here not with changes in individual security prices, but with those broad price movements that affect all or large classes of securities alike. These forces are general in their nature and exist for the most part in some general economic situation having little to do directly with statistical values. They are largely external and independent of forces inherent in securities themselves. The investor is compelled to perform his part in a financial and economic world where tidal changes are constantly occurring. To steer his course safely amidst these troubled waters is the task often imposed upon the investor who aspires to financial success. It will be found that security price movements by groups or *en masse* are only the reflection of certain fundamental forces in a dynamic economic world.

The dynamic economic world is a world of ceaseless changes. Yet these changes are only the manifestation of general forces seeking equilibrium—an equilibrium which is never stable but which changes as the dynamic factors themselves change in quantity or character. It is an equilibrium in which the human factor is constantly seeking a position of neutrality—a position of economic contentment. Thus as general economic forces strive to neutralize the human factor and to bring about an equilibrium of economic contentment, security prices often depart

widely from statistical values. A study of the major forces and movements in the dynamic economic world is basic to a study of security price movements themselves.

Types of Business Fluctuations.—To the casual observer the ups and downs of business and commercial life appear accidental or inscrutable. Likewise, active business men often fail to discover in the course of their operations anything more than a game of chance. Yet deeper study into the matter reveals orderly movements in economic life.

By the making of graphs and charts three separate and distinct movements in business have been clearly revealed. The first is the secular trend. This is an average increase in the volume of business, year after year, to keep pace with a growing population, expansion of trade, and industrial development in general. The shortest and least important movements of business are the seasonal valuations corresponding mainly to changes of seasons. The spring and fall trade regularly revive business after the winter and summer lethargy. The third movement is the business cycle. It is the rhythmic and orderly movement of business, corresponding to the ebb and flow of the tides of the sea. Its duration is generally several years in extent and always embraces a period of prosperity and a period of depression. These three movements are continuously in progress, each following its own orbit and impelled by independent forces.

To these three movements must be added a fourth group composed of heterogeneous irregular forces and events. They are made up partly of economic, partly of social, political, physical, and even psychological disturbances. Prominent among these may be mentioned wars, invasions, currency and banking upsets and catastrophes, tariff legislation, political and social contest and strife, calamities of nature such as drouths, floods, and earthquakes, and more recently the paralyzing influence of reparations and interallied war debts. These influences doubtless distort the orderly progress of the three well-established movements. On account of the irregularity of these forces, statisticians have not made any progress in eliminating them from cyclical data. Pure cyclical curves are therefore not possible in statistical analysis.

Secular Movements.—The most pronounced secular or long-time movements in economic affairs in the United States are occasioned by the growth of the nation itself. This has been the most important single influence in American economic history. It has been the story of a nation launched on its existence with its population scattered along the borders of the Atlantic Ocean but possessing illimitable possibilities of growth by expansion into the boundless stretches of territory to the west. The rapidity of this expansion and settlement depended upon the natural increase in population, supplemented by tides of immigration from the old world. Statistical records have been reconstructed by Dr. Warren

M. Persons,¹ running as far back as 1860, which show the increase in population, the growth of agricultural production and manufactures, and the increase in mineral production

*All of these series are alike in that they show rapid growth differing only as to the rate. The rate of growth is greater for the earlier than for the later period. This is a reflection of the gradual approach of the country to maturity. The practical lesson to be learned is that, guided by past experience, future growth is bound to continue only at a retarded rate. An application of this important fact may be ventured in the statement that business enterprise has in the past depended to a considerable extent upon the growth of the population and country and that this reliance in the future is bound to be progressively less and less. Success in the future will depend more upon the individual enterprise itself than upon the growth of industry, commerce, and trade. The personal factor will count for more in the future than it has in the past, just as it has counted for more in the recent period than it did in the remote past. Nevertheless, new industries may experience rapid growth in the future owing to the newness of their products. Progress in the aircraft and chemical industries, for example, proceed at a rapid rate regardless of the truth of these generalizations.

Seasonal Variations.—While secular trends constitute the longest movements discernible in economic data, seasonal variations are the shortest. The latter occur frequently and represent month to month, or week to week, changes in economic data. Such variations are discernible in a large percentage of all statistical economic series. Among them may be mentioned pig-iron and bituminous-coal production, imports and exports of merchandise, interest rates, bank clearings, railroad earnings, business failures, building, and many others. The movements are peculiar to each series of data. A composite chart, however, would show that the peaks and valleys have a fair distribution throughout the 12 months of the year. But, if the various data were combined in a single line representing business in general, seasonal movements in their totality are discernible for the four natural seasons of the year. It is these mass movements in production, distribution, interest rates, security prices, and the like, that are of especial interest to the investor.

Seasonal variations are the result of two separate influences, the one caused by changes in the weather from season to season, and the other by established conventions. The changes caused by the weather are of special significance for security price movements. The spring and fall are the seasons of peak activity, while summer and winter reveal the valleys. These phenomena in the United States are largely bound up with agriculture, which still is our most important industry. Primary

¹See his recent book *Forecasting Business Cycles*, Chap. 11, and frontispiece for diagram.

disturbances originating in agriculture radiate their influences to industry in general. Railroad traffic reveals clearly the effect of the fall movement of crops and livestock to markets. The latter is also reflected in bulges in bank interest rates, currency circulation, and so forth. On the other hand, building is traditionally most active in the spring and early summer and the demand for materials is felt in scores of industries dependent on the building industry. Summer is the busy season for agriculture and related industries, while other kinds of business drag. Winter is the season of general recession in business, except for the holiday trade at Christmas time. It will be found that all of the seasonal variations in general business, as well as for the special industries, find reflection in the financial markets.

Business Cycles.—The most characteristic movements of business, however, are not secular trends or seasonal variations but business cycles. They are of the greatest consequence to security holders and hence deserve to be studied at some length. These movements are regular in occurrence, although not periodic, in duration they fall between secular trends and seasonal variations. The leading student of business cycles has defined these fluctuations as

... recurrences of rise and decline in activity, affecting most of the economic processes of communities with well-developed business organization, not divisible into waves of amplitudes nearly equal to their own, and averaging in communities at different stages of economic development from about three to six or seven years in duration.¹

Historical Cycles.—Business cycles are old phenomena. Their origin in England goes back perhaps to the middle of the eighteenth century, although this early period has never been studied intensively. Investigation has been pushed back as far as 1790 for England and the United States, at which time cycles were plainly running their course much as they do at the present time. Mitchell finds their historical origin is concurrent with the development of modern business and money economy. The most characteristic mark of this economy is the use of money on a wide scale in both production and consumption processes. The pervasiveness of making and spending money seems to mark the stage of development when business cycles first appear. Again, the institution of profits seems to be the focal point of interest in modern business economy. Yet, "that way of organizing production, distribution, and consumption is a matter of importance—not the use of money as a medium of exchange. Instead of making the goods their families need, men 'make' money, and with their money incomes buy for their own use goods made by unknown hands."² So pervasive is this process that

¹ W. C. MITCHELL, *Business Cycles, the Problem and Its Setting*, p. 468.

² *Ibid.*, p. 63.

even farmers nowadays are mostly dependent upon the making and spending of money for their own existence

A contrast is furnished between the business crises of early times and those of modern times through the investigations of Dr. Scott in England for the period prior to 1720 and those of Dr. Thorpe subsequent to 1790 Mitchell compares the early with the modern period on six points as follows.

1 The causes of crises in the early period are attributed to famines, plagues, wars, relapses in public finance, or high-handed acts of governments, while none of these are primarily responsible for modern cycles

2 Many of the early crises lasted 3 years or more, while modern depressions are generally much shorter

3 In the early period crises are as likely to come after a period of depression as before, while in the modern period they follow a period of prosperity

4 In early times periods of prosperity tended to persist, the crisis coming merely as an interruption to good times In the modern cycles periods of depression tend to persist

5 The average length of the recurrence is approximately the same for both periods but the intervals are highly irregular in the early period

6 In the early period the order of development is decidedly irregular In the modern period the order of depression, revival, prosperity, and recession are unvarying Mitchell concludes that the English crises of the early period 1558-1720 were "not the business crises of the modern type, and the intervals between these crises were not occupied by business cycles"¹

Business cycles should not be confused with crises A crisis is in reality a turning point. Crises are strains which may develop during any phase of the cycle They come to interrupt the more or less normal development of the cycle. Although they usually occur at the end of a period of prosperity and the beginning of the decline, they have also been found to occur during the depression phase as in the case of the world financial crisis of 1931 This crisis, as well as the stock market crisis of 1929, was financial in nature. Historical crises have not always been business crises either The crisis of 1837 was primarily an agricultural and banking, or currency, crisis. So the panic of 1893 was closely associated with currency difficulties brought about by unwise legislation.

Business-cycle Theories.—The development of business-cycle theory has been in progress for more than a century in England and continental countries. The earliest of the important writers was Sismondi, an Italian Swiss who earned for himself the title "father of business-cycle theory" His work *Nouveaux Principes d'Économie Politique* was published in 1819. In this volume the germs of several modern theories are found Almost all of the early writers and many of the modern ones confine their discussion to the crisis phase of the cycle But this method of treatment is defective, because this term describes only one phase of

¹ *Ibid.*, p. 80

the cycle The four phases of the modern cycle are now quite generally recognized to be depression, revival, prosperity, and recession.

Bearing in mind the diverse character of crises, it is little wonder that writers have found various explanations of the fluctuations of business. Yet no account of business-cycle theories would be representative which omitted the theories that deal primarily with crises instead of cycles. There is space here only for a brief enumeration of the leading theories.

A favorite, and perhaps the most widely held, theory of crises has long been the overproduction or underconsumption theory. According to this theory, periodical gluts in the commodity markets appear when goods are produced in too great quantities to be sold at a profit. The result is a fall in price, unemployment, restricted production, and many other evils.

Certain other writers have held that ill-adjusted production, rather than overproduction, brings on crises. Under modern conditions it takes considerable time to produce goods. Planning for the future thus becomes necessary and mistakes in investment are likely to be made. Poor judgment of business men is generally held responsible for ill-adjusted production.

Closely akin to these theories is the socialist theory propounded by Rodbertus and Karl Marx. This theory holds that there is an excess of value in production over the amount paid to the workers. Hence overproduction results because no market can be found for the excess value of the product and goods can be disposed of only at disastrous prices.

More recently the causes of crises have been sought in inflation of the currency and rising commodity prices. Rising prices stimulate business activity and lead to overproduction and stocking up with commodities, speculation in the financial markets, exhaustion of credit and loss of confidence, and finally in a grand crash of prices.

An entirely different point of attack is made by those who seek to explain business cycles on psychological grounds. Psychological theories seek to find the original cause in the tendency of men to go to extremes. Optimism develops which stimulates business activity until errors of optimism are committed in the recklessness of business activity. Finally the matter is overdone and a crisis follows. Then men become extremely pessimistic, in fact commit errors of pessimism in the opposite direction, and business stagnates. When it is discovered that the extreme pessimism was unjustified, optimism again returns and business emerges from the depression. This theory has been a favorite with English writers.

Not satisfied with these points of attack, some writers have sought explanations in the weather. As early as 1875 W. Stanley Jevons based his theory upon sun spot cycles. The thesis ran, sun spots control solar

radiation, which controls weather, in turn the weather influences crops and crops affect business conditions. Professor H. L. Moore seeks to establish definite 8-year weather cycles of rainfall caused by the passage of Venus between the sun and the earth. Sir William Beveridge attempted to correlate the weather with wheat prices. Others have made business depend indirectly upon the weather by correlating the weather with health. Again, variations in agricultural (organic) production as compared with those of the inorganic industries have been advanced as a cause of cycles.

Some modern theories emphasize saving and spending. On the one hand, scarcity of capital has been held as the cause of crises. The accumulation of savings in times of depression and revival, with accompanying low interest rates, is followed by exhaustion of the savings fund and high interest rates at the end of the period of prosperity, which in turn produces the crisis. On the other hand, John A. Hobson emphasizes the accumulation of capital, instead of its exhaustion, and thus comes to the opposite conclusion, namely, that the trouble is in oversaving, rather than undersaving, or scarcity of capital.

Among the earlier writers who have a distinctly modern tone is George H. Hull, an American iron master. This writer believes the trouble lies in the construction industry. Construction is divided into necessary and optional. The former includes repairs, replacements, and renewals, while the latter includes only new construction projects and it is the variation in the latter that is most characteristic of business cycles. The motivating force lies in the opportunity for profits in new undertakings. Construction proceeds when costs are low and profits are promising and in this situation great activity prevails. When costs mount and absorb profits, business men are discouraged and activity in construction and business in general falls off, industries serving construction work are hard hit and unemployment and falling prices are the result.

The most recent development of saving and investing theories is that propounded by Messrs. Foster and Catchings. These authors insist that the cause of depressions lies in the ordinary processes of saving. Savings made by corporations and individuals alike reduce purchasing power for consumers' goods, so that no market can be found for the excess goods produced at the prevailing price level. Borrowing at the banks for increased production merely aggravates the resulting overproduction. In order to avoid depressions, consumers must somehow obtain enough purchasing power to absorb the entire product of industry. But this cannot be done under the present economic régime because profits are necessary to its very existence. Thus the "dilemma of thrift" is reached. One finds suggestions for betterment by placing into the hands of consumers sufficient money to absorb the products of industry. Somehow

money should be kept flowing through the hands of consumers to accomplish this end. The simplicity of this theory has appealed to many.

Contribution of Theories.—Most of the theories of business cycles have one thing in common. They attempt to establish a single cause underlying all cycles. In the search for this cause many different aspects have been emphasized. And this has been valuable, in that it reveals the complexity of cyclical fluctuations. It also partakes of the anatomical, in that it dissects cycles into the numerous processes that go to make up business and finance in their totality. One thus gets a picture of business cycles as composed of numerous processes. One finds cycles of production for each of the different industries, cycles of distribution, of imports and exports, of banking phenomena, interest rates and bond yields, stock prices, and so forth. The discovery of these processes and relationships constitutes the leading contribution of theoretical economics to the understanding of business cycles. It cannot be said, however, that any explanation which emphasizes only a single process is a sufficient explanation of business cycles.

Statistics and Business Cycles.—Traditional business-cycle theory is defective, in that it seeks to solve a problem largely quantitative in its nature by qualitative analysis. The theories lack definiteness and ability to measure movements and processes. This defect is remedied by bringing quantitative data into the analysis, thus enabling one to assess the relative importance of the various factors concerned. These data require mathematical treatment before their significance can be discovered.

Although statistical work had its beginning in the early part of the nineteenth century, W. S. Jevon's work half a century later dealing with seasonal variations and index numbers of commodity prices represents the first real advance. In the meantime Galton, Pearson, and Yule developed the method of mathematical correlation commonly used nowadays in analysis of economic time series. More recently came the work of Fisher, Persons, Snyder, King, Crum, and others, each of whom has made valuable contributions to statistical method in the solution of economic problems.

The contributions of these writers in the statistical field have made possible the calculation of seasonal variations, secular trends, and cyclical (but not irregular) fluctuations. This type of work permits the measurement of the exact relation of one time series to another through the process of correlation. Graphic presentation of the results of statistical studies has added to an understanding of processes also. The results of these studies lead to the conception of business cycles as a composite of a host of mutually interrelated processes. Business-cycle theory thus becomes largely "analytic description." Perhaps the future may yet reveal an underlying cause which is cyclical in its nature and powerful

enough to be designated as most fundamental among all the influences discussed by students of the subject

Profits and Business.—Professor Mitchell has made an attempt to correlate all of the various factors and forces in terms of business profits (the exact meaning of which he leaves to conjecture) Profit is the sieve by which all internal and external forces that affect business processes are sifted out "It is only as these changes affect the prospects of making money that they affect business activity"¹ The chance for increased profits stimulates business activity and the lack of such prospects leads to stagnation Thus profits become the key to the understanding of business which enables us to assess the influence of any factor on the future of business activity

Economic Equilibrium—One returns at this point to the conception of equilibrium as basic in any explanation of business cycles The most prominent characteristic of business is its dynamic nature Statistical work has amply shown this to be a universal truth Even the conception of business as "normal" is likely to be misleading Equilibrium means the balance of economic and psychological forces It represents a balance between production and consumption, between reward and effort It requires full employment and wages which produce contentment It finds a balance between all of the distributive shares under the system of specialization of function and division of labor Interest, rent, and profits, as well as wages, all must produce satisfaction Such an equilibrium would be an equilibrium of progress through cooperation

Without this equilibrium maladjustment produces discontent at focal points, and if it becomes powerful enough it may upset the entire business and financial structure Such upsets finally reach physical, economic, or financial limits and a check is administered through sheer exhaustion This occurs at the two extremes of cyclical movements, namely, at the peak of prosperity and in the valley of depression The origin of both prosperity and depression is thus found in the previous phase of the cycle

Some of the outstanding forces that are powerful enough seriously to interfere with economic stability will now be considered These forces may be classified as internal and external The former originate within the business or financial mechanism itself, while the latter lie without the organization but by their impact upon it throw it out of gear

Price Changes.—Economic equilibrium may be upset through a change in value relationships These involve the prices of commodities, wages, interest, profits, and rent Disturbance in any of these tends to create a state of disequilibrium affecting large numbers of people directly and indirectly and is reflected throughout the entire economic fabric Important instances of this are in the case of unequal changes in the prices

¹ *Business Cycles*, p 107

of the raw materials of production as compared with the prices of the finished products, changes in wholesale as compared with retail prices; changes in the prices of stocks and bonds as compared with the income which they produce, and changes in the income from capital commitments in general

Changes in Capital Values.—Changes in capital values are likely to be of unusual influence on business affairs. Capital values represent savings and are of multiplied importance compared with the current income. Loss of capital is most discouraging to those who have earned and saved and it puts a damper on confidence in future business. The security of savings is thus a basic requirement for economic stability. On the other hand, exceptional advances in capital values, in the value of stocks and bonds, real estate, and all forms of capital are invariably accompanied by overoptimism which produces a boom period, just as exceptional declines in these values invariably produce a state of morbid pessimism which is difficult to break. The most recent examples of extremities in both directions were the boom years of 1928-1929 and the depression of 1930-1932. Undoubtedly the savage break in the capital markets in 1929 and the world-wide decline in securities which followed were largely responsible for the severity of the depression.

Causes of Commodity-price Changes.—Changes in the average price of commodities have given rise to two leading theories. First, there is the traditional theory that changes in the average price of commodities come about only through monetary causes. This explanation attempts to establish the thesis that the level of commodity prices is determined by the result obtained by multiplying the amount of money and credit in circulation by its velocity and the amount thus obtained divided by the number of transactions in commodities. The formula runs as follows $MV + M'V' = PT$. There is undoubtedly a certain truth in this formula but it tells nothing in regard to cause and effect. It simply states that the total amount of money and credit employed in the transfer of goods divided by the volume of goods gives the average price per unit. This is merely an obvious mathematical truth. However, the so-called "quantity theory" maintains that changes in money and credit are causative in their influence upon average prices. In an ultimate sense this is probably true. But it must be understood to be causative only in a permissive sense. To be sure, without money and credit to facilitate expanding business and a tendency toward higher prices, such movements could not advance very far.

Price Margins.—The reasoning of the quantity theorists has special application when the subject of trends in prices is under consideration. But for purposes of explaining cyclical oscillations in commodity prices, one must invoke the processes of business themselves. The business world of today is largely a world of exchanges where buying and selling for

a money consideration prevail Profits constitute the goal of endeavor and are the result primarily of the margin between the cost of goods and materials including expenses of fabrication or handling and selling prices As prices change in any part of the business mechanism, their repercussions are felt throughout a large part of the price system Profits are disturbed and efforts at readjustment are made Thus a rise or fall in the prices of raw materials will find reflection in the prices of finished commodities and in turn be reflected in efforts at wage and interest readjustments

Changes in average prices may originate in any one of the fundamental processes of business They frequently originate or receive acceleration at the hands of consumers when demand for consumption goods takes on increased impetus In order to supply an accelerating demand for their wares, dealers place orders in multiplying volume with producers Demand thus becomes cumulative from consumers back through retailers, wholesalers, producers, and finally to the demand for raw materials Thus a comparatively small increase in the general demand for consumers goods may result in multiplied orders for raw materials out of which to manufacture additional goods, on the prospect of increased future demand at higher prices. In case of falling prices the exact reverse takes place

Demand and Supply—In all of this process the forces of demand and supply are of paramount importance. A disturbance at one point in business processes usually occurs through changes in demand or supply at that point This is the initial disturbance to a given price equilibrium Its severity will determine the extent of the general price changes throughout the entire economic structure To take a single illustration, the precipitous decline in commodity prices initiated in 1929 and extending into 1932, almost without abatement, was initiated by overproduction in many lines of business Most important in this situation was the overproduction of raw materials which have a world market Among these were excessive stocks of many agricultural products, such as cotton, wheat, sugar, rubber, natural silk, and coffee To these were added excessive supplies and productive capacity of certain mineral and chemical products, as copper, silver, nitrate, petroleum, coal, tin, and rayon Excesses in the building and automotive industries aggravated the situation

Speculation.—Speculation often interferes with the smooth working of the equation of exchange, in that money and credit are used for speculation in land, commodities, and stocks Money and credit that are absorbed in speculative activities cannot, of course, have any appreciable effect upon commodity prices Excessive credit was thus absorbed in 1928 and 1929 in real-estate and stock market speculation

The Time Element—Finally, the equation of exchange does not take account of prices made in advance of increases in money and credit

and in circulation. Prices are made at the time contracts are entered into or orders given, typically months before deliveries or payments are made. This characteristic process of business (and the general principle applies to speculative contracts as well) is determining in its effect, on prices. It illustrates the positive force of the human factor in price making.

The Influence of Banking.—The positive influence of banking and credit conditions in general is exerted at the crisis phase of the business cycle. It may truly be said that upswings in business often reach their zenith only after easy credit conditions have passed and interest rates have risen. Particularly when the expansion of bank loans, on account of limited reserves, can go no further, does the credit situation exert a depressing influence upon business projects. Unfinished plans and contracts are completed only with great financial difficulty and new projects are discouraged entirely. Limitation of the credit supply serves to turn optimism into mild pessimism, and as liquidation follows gloom gathers on all sides. Prices fall and the basis of credit is being more and more undermined. Banks themselves make an attempt to put their houses in order by contracting loans further and further, and with each additional step confidence grows less and less until it finally reaches a state of utter collapse. Such a state was reached in 1931 and extended into 1932 before Congress attempted to halt the process of liquidation and restore confidence.

Volume of Business.—In addition to changes in commodity prices, another leading force in disturbing the business and financial equilibrium is changes in the volume of business transactions. Profit margins in themselves do not tell the entire story, since the profit per unit of goods multiplied by the number of units sold determines the total net profits. Changes in the volume of production and distribution of goods appear from one phase of the cycle to another. They are especially characteristic of certain fundamental industries. Volume fluctuates largely according to demand in the case of reproducible manufactured goods and according to the weather in agricultural products.

Agriculture and Business.—Statistical evidence shows plainly that agricultural production depends upon the yield per acre rather than the crop acreage, the latter factor showing a remarkable constancy. There appears to be a definite correlation between size of crops and business cycles. Abundant crops tend to produce business activity, while scarce crops and high prices tend to restrict activity. These results are doubtless due in part to varying costs in manufacturing articles dependent upon agriculture for raw materials. They are also due to changes in the cost of living which result from changes in the price of food products, which in turn have a tendency to govern the amount of wages paid labor. Large crops and low prices mean cheaper raw materials and low wages

for labor, while scarcity of crops means high prices of raw materials and high wages

In another way variation in crops affects business. The prosperity of the farming class furnishes large buying power for the products of the factory. It leads to modernization of equipment on the farm, which in itself gives great stimulus to the industries serving agriculture. These mutual relations are inevitable in an economy where division of labor between country and town exists. The most fundamental divisions of labor lie between these large interests, in the mutual exchange of their products a balanced income is necessary for general prosperity and contentment.

Wages and Business.—It has been seen that certain theories of business cycles are based largely upon some aspect of wages. This is clearly claiming too much. The purchasing power of the farm is vital to sustained prosperity. The income of the laboring classes no doubt is vital to good business, for this class constitutes a large portion of the total purchasing power. As reckoned by Dr King, wages constitute about 37 per cent of the total income of the people of the United States. Moreover, labor spends a larger proportion of its income on consumers' goods than any other class of society. A falling off in the demand for consumers' goods through inadequate payrolls doubtless finds its effects in reduced demand for finished consumers' goods and also for the capital equipment which is necessary to satisfy this demand.

Nevertheless, we must be mindful at this point of the elasticity of production of consumers' goods. First, large stocks of consumers' goods accumulate during a period of abnormal activity in business—stocks sufficient in amount that production may be greatly curtailed, and indeed must be, in order to reduce excessive supplies. This is another case of ill-adjusted production of consumers' goods, more than the demand calls for. It is beyond the realm of possibility that wages could be increased rapidly enough to absorb the excessive production of raw materials and consumers' goods alike in the presence of these periodic gluts. Wages and payrolls in 1926 were 25 per cent higher than they were in 1914.¹ Yet this greatly improved standard of living was entirely powerless in preventing overproduction and collapse of prices in the period 1929-1932.

There is probably no sounder economic principle than that which makes high wages depend upon high productivity. As has been pointed out before, it is rather overproduction in certain important fields that upsets the price structure and creates economic disequilibrium. The more or less obvious fact need not here be argued, that, given an adequate system of diversified production and exchange, general overproduction is an impossibility. This was the kernel of truth in the argument of the classical economists against overproduction.

¹PAUL H. DOUGLAS, *Real Wages in the United States, 1890-1926*

International Business Cycles.—Recent investigation has shown the universal character of business cycles. Dr. Thorpe in the *Annals of Business* has shown that business cycles prevail in each of the 17 countries which he investigated. The most striking result obtained in this study is the similarity of cycles in the various countries. All reveal the four phases of depression, revival, prosperity, and recession in turn. For England and the United States the period covered goes back to 1790, for France to 1840, for Germany to 1753, for Austria to 1867, and for Russia, Sweden, Netherlands, Italy, Argentina, Brazil, Canada, South Africa, Australia, India, Japan, and China to 1890. Professor Mitchell estimates that in the entire world's history perhaps a thousand business cycles may be found.

The international connections between major cycles in different countries has long been a matter of comment. Thus the crises of 1873, 1920, and 1930-1932 were felt in most of the leading countries of the world. It has not so generally been noticed, however, that the crises of milder intensity also were international in their scope. There were 10 countries which felt the recession of 1890-1891; 15 experienced the recessions of 1900-1901 and 1907-1908, 12, in 1912-1923, 11, in 1918, and 14, in 1920. Crises and panics, however, do not strike with the same intensity in all countries. Thus the crisis of 1873 bore mildly upon England and France, while the financial crisis of 1893 was severe in England, Germany suffered heavily in 1900, 1907 was especially an American crisis. The extended depressions of the eighteen hundred seventies and eighties, the revival in the eighteen nineties, the boom of 1906-1907, the mild prosperity of 1912, and the severe depressions of 1920 and 1930-1932 were almost universal in scope.

Although business cycles do not run parallel courses in any two countries, there is a high degree of synchronization in case of English cycles with those of other countries and very close agreement with those of France and Germany; but loose agreements are found between American and Austrian cycles. In viewing the historical cycles as far back as information reaches, there is found a close correlation of the respective phases with one another in the various countries. Since 1890 Mitchell finds an international pattern of cycles which can be traced in the various countries as follows:

First cycle, 1890-1891 to 1900-1901.

Second cycle, 1900-1901 to 1907-1908.

Third cycle, 1907-1908 to 1913-1914.

Fourth cycle, 1913-1914 to 1918.

Fifth cycle, 1918 to 1920.

Sixth cycle, 1920 to 1932(?) (last dates ours)

Within this period the United States had 12 cycles, the intervals between those common to many countries were punctuated with minor cycles as,

for example, the depressions of 1924 and 1927. Certain other countries also show minor cycles for which there is no international pattern. Cycles in countries which are economically backward, such as Russia, South Africa, China, and Brazil, run a more or less independent course.

The international connection of business cycles is doubtless due to the international dealings in business and finance and even to political relations. Prosperity in one country creates a demand for the products of other countries, while depressions act in the opposite way. Moreover, there are the financial ties between countries. These take the form of international short-term financing by the large banking institutions in the various countries for the furthering of international trade, there are also the permanent financial relations through foreign investments with their interest and amortization payments, all of which have a profound influence on the international flow of gold. It is indeed true as Mitchell remarks that "the quiet business forces working toward uniformity of fortunes must be powerful indeed to impress a common pattern upon the course of business cycles in many countries."¹

Duration of Cycles.—Traditional accounts of business cycles assign a period of 10 years to the average cycle. Substantially the same period was assigned by Jevons and other modern writers, Cassel's data produce $8\frac{1}{2}$ years, Moore's, 8 years, while still others find 6 or $6\frac{1}{2}$ years to be the average duration. Most of these writers seek to establish a certain periodicity in cycles, an attempt which has been abandoned by most authoritative investigations of today. Statisticians and other investigators now place the average at about 40 months. Mitchell finds that from 1790 down to 1923 the United States passed through 32 cycles with an average length of not quite 4 years, 3 years being the most common period. In England the average for the same period was $5\frac{3}{4}$ years, in France, $5\frac{1}{2}$ years, in Germany, 5 years. Evidence seems to show that cycles in England for the past 75 years averaged about 7 years, the assigned reason for which is the industrial maturity of the country compared with the United States and other newer countries. Rapidly developing countries show comparatively shorter cycles.

Prosperity and Depression.—Of all the cycles investigated by Dr Thorpe, the number of months of prosperity was 39.3 per cent of the total, the months of depression 36.8 per cent, and those of revival and recession together only 23.9 per cent. From 1790 to 1925 in both England and America, the months of prosperity have gained materially upon the months of depression, the period 1890-1925 showed 1.71 and 1.79 years of the former to 1 year of the latter in the respective countries. All of the most highly developed countries show that the years of prosperity greatly outnumber those of depression, while countries backward in their industrial development show the opposite result. Most inter-

¹ MITCHELL, *op cit*, p. 450.

esting also is the relation of the commodity-price trend to the duration of prosperity and depression, respectively. The years of prosperity to years of depression in England and the United States since 1790 during periods of rising and falling prices were as follows:

England	United States
1790-1815, prices rising 1 0	1790-1815, prices rising 2 6
1815-1849, prices falling 0 0	1815-1849, prices falling 0 8
1849-1873, prices rising 3 3	1849-1865, prices rising 2 9
1873-1896, prices falling 0 4	1865-1896, prices falling 0 9
1896-1920, prices rising 2 7	1896-1920, prices rising 3 1

MITCHELL, *op cit*, p. 411

Cyclical Amplitudes.—Cyclical amplitudes among the numerous processes of business and finance vary greatly among themselves and from one cycle to another. All of the so-called "indexes" of general business show this. Dr. Person's *Index of Industrial Production and Trade for the United States* shows that the deepest depressions seldom extend below 80 per cent of average production and trade. Only in the eighteen hundred nineties and in the depression of 1930-1932 was this true. For the latter period the line fell below 70 per cent, which indicates the severest business depression in the entire period covered by the index. Likewise in periods of prosperity business seldom exceeds 120 per cent of the average, it did, however, in 1881, in 1917, and in 1918. The most prominent feature of the index is its ceaseless movements upward or downward. Evenness of business experience seems to be merely an imaginary ideal. Only two periods since 1875 may be thought of as periods of comparative stability, namely, 1901 to 1903 and 1925 to the middle of 1929. In both of these cases activity was near the average or trend line.

As measured by the method of standard deviations, various other processes show pronounced differences. At the one extreme, standard deviations in call-loan rates, clearings in New York City banks, interest rates on commercial paper, and yield on United States government bonds, all of which show standard deviations of 20 or higher. At the other extreme stand wholesale prices of commodities, interest on railroad bonds, and loans and deposits of New York City banks, all of which show deviations under 10. Midway between these extremes come industrial and railroad stock prices, imports of merchandise, business failures, dividend payments of corporations, and interest rates on 4 to 6 months paper. Furthermore, the same method of calculation shows that retail trade fluctuates less than wholesale trade, and wholesale trade less than production of the same commodities. Bank clearings in large cities are far more variable than those of the country at large, and foreign trade more than domestic trade. On the other hand, the relatively small deviations in wholesale prices stamp them as one of the comparatively stable factors in

business Only world-wide upheavals affect drastically commodity prices

Business Forecasting.—Much time and effort have been spent during the past 10 years toward the development of scientific and statistical methods of forecasting cyclical changes in business Doubtless much has been learned during these years, statistical technique has been vastly improved, so that, however far off seems the ultimate solution of this problem, much progress has been registered.

The sequence method of forecasting, a species of which was first employed by the Brookmire Economic Service many years ago, was developed by the Harvard Economic Society under the guidance of Dr W M Persons, for a while it gave great promise of accurate results The Harvard method was based upon the statistical analysis of the period 1903-1913, a period of comparative economic stability and free from wars and international disturbances of serious character The World War, however, with the accompanying upset in the old order of economic life changed the prospects of the success of this system of forecasting Like every other system of forecasting with which the author is acquainted, in the actual work of forecasting more and more attention was paid to economic developments not revealed by the statistical data Statistical data cannot be used for the measurement of many of the powerful forces in business and finance Hence the limitations of selected data are correspondingly great and perhaps will always be defective

This situation has led many forecasters, including Persons himself, to seek another avenue of approach to the problem which seems to offer greater hope. This method of forecasting is well explained by Dr Persons in his recent work *Forecasting Business Cycles* The fundamental basis of forecasting is the experience with business cycles in the past as revealed mainly in the *Index of Industrial Production and Trade for the United States* It is essentially an appeal to history and finds a certain uniformity of cyclical development as the normal order of things which however is at times altered by events outside of business itself—"external events" The appeal to experience makes the method "realistic," while the fact that the forecasts themselves may be altered to correspond with new evidence makes it "elastic" Forecasting then is "an elastic realistic concept of probable future developments."¹ Specifically the procedure consists in finding precedents for current developments—the more precedents, the greater the certainty of the forecast—and basing current forecasts upon the known precedents Allowance is then made for the modifying influence of current events of importance.

Business Cycle Experience.—For purposes of forecasting, the cycle is divided into the following four phases:

¹ Page 33

Prosperity—This is measured from the time the index of production and trade passes the 100 line on its way upward and ends with the month immediately preceding a persistent decline to subnormal business

Recession.—This extends from the first month of persistent decline to the trough of the depression

Trough—This is the interval at the bottom of the depression during which the monthly change in the index is two points or less

Recovery.—Recovery is the period of persistent advance to the 100 line of the index

Month-to-month changes in the index through the various phases of the cycle reveal certain fundamental facts which are important in forecasting Data on this from W. M. Persons, *Forecasting Business Cycles* (page 203) are as follows:

During the period of 654 months for which we have counted the month-to-month changes, February 1875–July 1929, inclusive, there were 56 months of trough, 109 months of recovery, 299 months of prosperity and 190 months of recession

The trough of November 1910–January 1912, lasting 15 months, was unique in length The troughs of major depressions ranged from 5 to 7 months except in November–December 1914, when war orders stimulated recovery, October 1896, when the free silver issue was defeated, and December 1878, when specie payments were resumed The troughs of minor depressions lasted only one month except in November 1910–January 1912 during the “trust-busting” and anti-railroad activities of the Federal and State governments, and in July–October 1898, during the Spanish War

Recoveries from major depressions lasted from 12 to 16 months, except in 1915 and 1879 when war orders and phenomenal crops shortened the interval to 10 and 9 months, respectively Recoveries from minor depressions lasted between 1 and 5 months, with the usual figure at 3 months

Periods of “prosperity” in the United States have lasted from 4 to 44 months The longest intervals were those of October 1879–July 1883, after specie payments had been resumed, prices were rising and crops were unusually bountiful, the war period of November 1915–July 1918; and November 1904–July 1907, a period of rising prices, bountiful crops, and industrial consolidations Very short periods of prosperity lasting 4 to 7 months followed the major depressions of 1894, 1908 and 1921.

The longest period of recession on record, 34 months, accompanies the return, in 1876–78, to specie payments The decline was briefly interrupted by a good crop and price situation in 1877 and bumper grain crops, though at lower prices in 1878 The second longest interval of recession was from November 1912 to October 1914, partly a war decline. Of the remaining recessions, six lasted from 10 to 16 months and eight lasted from 3 to 7 months.

During the 654 months covered by the index since 1875, recovery and prosperity marked 63 per cent of the total, while recession and the trough showed 37 per cent Viewed in another way, of all the months taken into account, subnormal business, that is, when the index was below the

100 line, accounted for 38 per cent of the time, while normal business, that is, when the index was above the line, accounted for 62 per cent

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CHAPTER XXXVIII

BOND PRICES

In beginning the study of bond prices it may be recalled once more that this problem is merely one side of the problem of interest rates on long-time investments. Changes in the forces of supply and demand for current investment funds determine interest rates and prices. Whether one views the matter from the point of view of historical movements or short-time fluctuations, this principle seems to be elementary in an investigation of bond prices and yields. The discussion of bond prices and interest rates will therefore revolve largely around the changing forces in demand for and supply of investment funds.

Historical Interest Rates.—Economists and other writers have long observed that interest rates, and hence prices of long-term investments, show wide variations from one period to another and from one country to another. While this entire matter is sadly in need of investigation, certain characteristics may here be noticed. It is commonly accepted that in the seventeenth century the interest rate in Holland was as low as 3 per cent. This low rate was doubtless due, in part at least, to the commercial character of the country and the accumulation of funds for investment purposes. In the following century before the industrial revolution both Holland and England were able to borrow at about the same rate as in the preceding century, namely, 3 per cent. With the industrial revolution came a rise in the rate to 4 or 5 per cent in older countries and this persisted throughout the first three-quarters of the nineteenth century. The newer uses of capital doubtless were largely responsible for this increase.

In newer countries possessing large natural resources and opportunity for the employment of capital on a large scale, the interest rate is invariably higher than in older and more stable lands. In the United States, for instance, in the first half of the nineteenth century, 6 per cent was the minimum rate on capital funds for long-time investment. Bonds issued by the various states in support of internal improvements customarily bore 6 per cent interest. Wars with their huge demand for capital have invariably acted greatly to augment the interest rate and depress bond prices. So the Civil War period was one of high interest rates on all classes of investments. The interest rate in the United States tended to decline during the final quarter of the nineteenth century, it approached that of France and Germany, although it was still higher

than in England. The low rate in England has been attributed to the long-time freedom from devastating wars and gradual accumulation of a large supply of capital, so large that England built up large foreign investments of capital in Canada, Australia, Argentina, South Africa, and Chile, where rates were generally appreciably higher than domestic rates.

In large and rapidly developing countries such as has been the case with the United States during most of its history, it is further noticeable that the newer sections show the same relative scarcity of capital, higher rates of interest, and lower prices of bonds. New England has from early times been the source of large amounts of capital that found employment in the interior of the country. The East still is the chief source of capital for the West and South. The incentive for transferring funds to other sections of the country has always been the higher rates obtainable than in the home market.

Looked at in the broadest way, these historical experiences stand as evidence of the interplay of the forces of demand and supply on an inter-sectional or international scale sufficient to establish substantial differences in rates. The older a country becomes, the normal tendency would be in the direction of greater accumulation of capital and lower rates. Throughout the past 150 years the influence of new inventions and better opportunities for the employment of capital have resulted in a substantial rise in the interest rate. The future of the interest rate likewise will depend upon the equilibrium of supply and demand, "the race between accumulation and improvements," for the most part, barring the unpredictable influences of future wars and their colossal demand for funds.

Bond Price Movements.—Aside from the historical changes and differences cited above, there is statistical evidence of the movements of average bond prices and interest rates going as far back for the United States as 1875. For purposes of analysis, four types of movements may be distinguished after the analogy of similar movements in economic and business conditions in general. These movements may be designated as follows: (1) secular trends, (2) cyclical movements, (3) short-time fluctuations, and (4) irregular changes. Each of these movements possesses the common characteristic that it is a reflection of the effort to find equilibrium in the financial world, whose main characteristic is dynamic change. Each movement can be analyzed by seeking out those forces in the demand or supply side of the equation which are continually reflected in market prices.

Secular Movements.—In the discussion of bond prices, in view of the incomplete character of the present stage of investigation, no effort will be made to go back further than 1875. This date marks the year of the enactment by Congress of the law providing for the resumption of specie payments by the United States Government. These payments

were to begin January 1, 1879. The most scientifically constructed index of average bond yields is the Macaulay index of the National Bureau of Economic Research. This index is based upon the yield of high-grade American railroad bonds and hence gives a true picture of the yield on bonds with negligible risk, thus eliminating this disturbing factor from the picture. In order to convert this yield index into a price index, monthly figures for average yield were capitalized on a 4 per cent basis.

This period reveals three distinct long-time movements in bond prices. The first extends from the beginning of our period in 1875 down to 1899, the latter year shows a sharp reversal of the trend, which continues until 1920 when the movement once more is reversed, since then, with the exception of the cataclysm of 1931, prices have shown an upward trend.

Bond Prices from 1875 to 1899—The upward movement of bond prices during the last quarter of the nineteenth century has usually been explained on the basis of an opposite movement in commodity prices. The theoretical arguments as to the connection between bond prices and commodity prices have been dealt with in a preceding chapter. The main conclusion, it will be recalled, was that no case can be made for the thesis that investors willingly pay higher prices for bonds in periods of falling commodity prices and conversely are unwilling to pay high prices when commodity prices are rising. The general downward trend of commodity prices during this period, however, was of great significance but its influence was indirect rather than direct.

The annual index of commodity prices of the Bureau of Labor shows a downward trend from 1875 to 1899. Such a persistent decline in prices of commodities could not but have had an adverse effect upon business profits and restrict the demand for additional capital from industry, owing to the declining cost of construction and lessened need of money for working-capital purposes. The entire period was one of low profits and a restricted demand for new capital. It was also marked by strikes and hostility between capital and labor, agricultural discontent, and in the eighteen hundred nineties by disturbances to the integrity of the gold standard. These influences doubtless operated to restrain enthusiasm for stocks and make for higher bond prices.

A partial explanation of the rise of bond prices from 1875 to 1899 may be found also in the financial operations of the government. The interest-bearing debt of the United States was at its maximum in 1866, and from this date till 1889 the government paid out \$1,607,018,000 on the principal amount and \$2,053,534,000 in interest, or a total of \$3,660,552,000. This was a vast sum of money for those days, when it is remembered that the population of the United States was but 38,558,000 in 1870 and only 62,947,000 in 1890. Moreover, the great bulk of this money was drawn from the masses of the people through customs

and excise duties on articles of consumption which otherwise would never have been available for investment purposes. On the other hand, there were comparatively few bondholders in the United States at that time, which meant that payments on account of both interest and principal on the national debt were lodged with those that reinvested the greater portion in railroad bonds, the only extensive class of bonds outside the government issues. Even the total amount of railroad bonds in the United States in 1890 was only \$4,574,000,000, and those listed on the New York Stock Exchange were small until toward the end of the period, when annual listings grew rapidly in amount and sales reached a high volume not exceeded for another decade. The floating supply of bonds and investment stocks must have grown smaller and smaller through the eighties.

Savings banks also had a large development during the period 1870-1890, increasing their deposits a round million dollars, while the assets of life insurance companies increased \$318,000,000 from 1880 till 1890. These funds, like government taxes, came largely from classes of people who without some special inducement would not have saved their money. Besides these sources of investment funds, the period following the resumption of specie payments in 1879 was accompanied by a wave of British investments in the United States.

It can be safely stated that in the period, say, from 1866 to 1890, more than five billions of dollars were saved and invested in the capital resources of the United States from sources other than those from which capital ordinarily came. This was a strong factor in bond prices of the period.

United States Bond Prices.—A record of prices of United States 4s of 1907 shows a similar trend downward in the yield during these same years. The condition of the federal treasury from 1893 to 1895, followed by the silver campaign of 1896 (the bonds were "currency" bonds), distorts the orderly trend of prices by casting doubts upon the integrity of the bonds, causing the highest average yield to appear in 1896, when it was 3 14 per cent, after that the decline was gradual till 1901, when it stood at only 1 98 per cent.

The decline in the price of the United States bonds of which the above issue is typical is accounted for by peculiar circumstances. They were deprived of their ordinary investment character by the fact of having been made the basis of national bank-note circulation. After 1891, the 4 per cent bonds of 1907 and 1925 were the chief bonds for security of note circulation. In 1890, the 4s of 1907 were selling as high as 125, and only 90 per cent of the par of \$100 could be used as a basis for note circulation. This rendered note issues unprofitable to banks and had gradually reduced national bank-note circulation from more than \$358,000,000 in 1882 to the extremely low figure of \$162,000,000 in 1891.

As the 4s of 1907 approached maturity, however, their price receded accordingly. This, together with the greater necessity for note circulation after 1890, encouraged again the purchase of these bonds for this purpose. In 1895, the 4s of 1925 were issued and extensively bought at high prices, nevertheless on conditions more satisfactory than the rapidly maturing 4s of 1907. The demand for bonds for coverage of note circulation, however, constantly increased, so that the amount held by national banks in 1902 was \$345,000,000. This enormous demand is reflected in the extremely low yield of only 1.98 per cent in 1901. The downward trend of the yield and the upward trend in the prices of government bonds are, therefore, to be sought in the extraordinary demand for them as security for the currency system. Yet in spite of this, there must have been some influence in the demand with reference to the general supply of funds during the period.

The downward movement in the yield of bonds during the last quarter of the nineteenth century is typical of all classes of investments. The records of earnings of life insurance companies throw much light upon this matter. The average earnings on all assets of six of the leading life insurance companies in the United States declined from 7.3 per cent in 1875 to 4.3 per cent in 1902, earnings on mortgage loans alone declined in the same period from 8.1 to 4.8 per cent; while the earnings on stocks and bonds together declined from 6.3 to 3.8 per cent. Thus the evidence goes to show that the last quarter of the nineteenth century was a period of extraordinary accumulation of capital funds, accompanied by a restricted outlet for these same accumulations with the resulting decline in yield on all types of safe securities.

Changes in the Investment Market.—In the closing years of the nineteenth century came a fundamental change in the investment market. Broadly, the change consisted in turning away from high-grade, low-yielding railroad bonds to bonds and stocks of lesser merit but offering greater returns to their holders. It resulted in an enlarged demand for second-grade railroad bonds, the bonds of industrial and utility corporations, and the better grade of all classes of stocks. The era of market dominance by high-grade railroad bonds was waning. A new era of investment and speculation was dawning. This is seen in the rise of railroad, and to some extent of industrial, stocks to a new level of prices. Never in all the past experience had there been a permanent advance in either railroad or industrial stock prices. This movement of railroad stocks reached its peak in 1906, with a return in 1909 following the panic of 1907.

The causes of this change in the character of the investment market appeared to be cumulative at the turn of the century. First of all should be mentioned the settlement in the political arena of the currency problem with the victory with the sound money advocates. This

removed the threat of bimetallism and greenbackism that had haunted the public for a generation and it guaranteed the future integrity of the gold standard. Coincident with this came the discoveries of fabulous new gold mines in Alaska, South Africa, and other parts of the world, which turned the tide of commodity prices upward, a trend which was to continue until 1920. At the same time there developed the major railroad and industrial consolidations with their promise of fabulous profits. So extraordinary was the period that it has been latterly called a "new era" period of finance.

Bond Prices from 1899 to 1920.—The decline in bond prices after 1899 must be explained on broad grounds. In the first place, it must be constantly kept in mind that the first two decades of the twentieth century were marked by a rapid rise in commodity prices. The index of wholesale commodity prices prepared by the Department of Labor shows an average increase from the low of 66 in 1896 to 100 in 1914, and a further rise to 243 in 1920, an increase of 177 per cent for the entire period. Rising commodity prices in the United States are explained chiefly on the grounds of enormous increases in the production of gold since 1896, as has been shown elsewhere; the inauguration of the Federal Reserve banking system accompanied by rapid expansion of credit during the war period, and the international movement of gold since 1914 in favor of the United States.

Rising commodity prices furnish the best stimulation known to business and industrial activity. The tendency is to overreach in new enterprises and expansion of old establishments, in anticipation of increased profits. Dr. Edmund E. Day has calculated an index of production for the United States since 1899.¹ This index shows that production expanded much more rapidly than the population increased during the 20 years following 1899. Producers' goods involving capital commitment increased much more rapidly than consumers' goods. At the beginning of this period most public-utility industries were yet in their infancy, while today they constitute an industry of almost equal importance with railroads. The period was, also, one of exceptional prosperity for the farming industry, which called for capital in the face of advancing land prices unequalled in any other similar period of history. It is unnecessary to give detailed statistics of this most remarkable period of American industrial history, since they are easily available to all.

The financial results of the economic forces of this period are seen first in the unparalleled amount of bonds coming into the investment market. Railroad bonds increased from \$6,109,000,000 in 1902 to \$11,180,000,000 in 1920, electric light and power bonds from \$254,000,000 in 1902 to \$1,297,000,000 in 1917.

¹ EDMUND E. DAY, *American Statistical Association*, Vol. 17, p. 552

Over against this flood of new bonds and mortgages must be set the increase in the funds available for investments of this grade. Periods of rising prices are indeed periods of relatively large profits in business, and it may appear at first sight that there should be ample funds to finance new undertakings. It must be remembered, however, that one is dealing here with a class of investments that does not ordinarily appeal to the business man, his profits, for the most part, are employed in extensions of his own business, leaving only a small proportion available for the purchase of bonds and mortgages. Furthermore, periods of easy profits engender extravagant habits and much of the increased profits are absorbed in an improved standard of living. Thus, only a limited amount of pure investment funds comes from increased profits.

One of the main sources of increase in investment funds of this character is through accumulation of interest and reinvestments. Money at compound interest at the rate of $4\frac{1}{2}$ per cent will double in amount in less than 16 years; in 25 years, it will almost exactly treble itself. Accumulation is thus a most important force of new investment funds.

Other important sources of investment funds are life insurance companies, savings banks, building and loan associations, and the like. The assets of life insurance companies increased from \$1,742,414,173 in 1900 to \$7,319,997,000 in 1920; those of stock and mutual savings banks, from \$2,600,000,000 to \$7,125,000,000; the assets of building and loan associations in 1920 stood at \$2,534,000,000, almost the whole of which was accumulated after 1900.

Within recent years, national and state banks have also purchased large amounts of government, municipal, and corporation bonds. The total amount held by national banks alone in 1920 was \$4,186,000,000. It is probable that national and state banks, together with loan and trust companies, owned outright \$10,000,000,000 of civil and corporate bonds. In addition to this, large amounts of money were loaned on bonds as collateral. Commercial banking institutions thus became to a large extent investment institutions.

Although large sums became available through these sources, they in no wise were sufficient to absorb the supply of bonds and mortgages. The balance between the forces of supply and demand was progressively upset, mainly through the excessive issues constantly coming into the market. Prices underwent constant readjustment downward in an effort to restore the equilibrium. After 1917 large profits in industry drew funds away from bonds and mortgages in favor of stocks which promised higher return in the face of greatly increased commodity prices. It appears that shifting from safe issues with comparatively low income to second-rate issues with a higher rate of return went on extensively after 1910, but with great acceleration after the outbreak of the World War.

Bond Prices since 1920.—The general trend of bond prices since 1920 has been strongly upward. The financial cataclysm toward the close of 1931 must be regarded as temporary and a part of the general breakdown of world credit. Recovery from such a situation may be relatively rapid. The problem is to discover those forces of a general and persistent nature which have been operative during the past decade and which are responsible for adding approximately one-third to average bond prices.

The rapid advance toward the close of 1921 and during most of 1922 was due only in part to the general trend; cyclical influences at the time were in favor of rising prices also. But after 1922 the general trend continued upward of its own force.

The basic fact in the rise in bond prices during this period was undoubtedly the general prosperity of the decade. The income of the people of the United States for this period as compared with pre-war days was greatly enhanced. The realized income in 1914 was about \$35,-250,000,000. With the war came a period of prosperity which after the interruption of 1921 continued until 1929. By 1928 the realized income in pre-war dollars had mounted to \$54,022,000,000, or an increase over 1914 of 54 per cent. Money income increased to \$89,419,000,000, or an increase of 154 per cent. With the increase in income came a corresponding increase in savings.

The expansion of bank credit since 1915 has been truly remarkable. In 1915 total resources of all commercial banks in the United States were \$32,266,000,000, in 1930 they stood at \$62,087,000,000, an increase of 94 per cent for the period. This enormous expansion of bank credit was occasioned by powerful forces. First, the creation of the Federal Reserve System with its concentration of reserves and reduction of reserve requirements of member banks. The second cause is to be found in the increase in the stock of gold coin or bullion in the United States from \$1,985,000,-000 in 1915 to \$4,593,000,000 at the end of 1930.

There can be no doubt that the expansion of bank credit was a powerful factor in the advance of bond prices during the past decade. In 1913 the total investments of all banking institutions stood at \$5,407,000,-000; even in 1920 the figure was as low as \$11,388,000,000; but the increase in the next decade showed a total investment of \$20,060,000,000, as of June 1, 1931. Investments in securities of member banks of the Federal Reserve System alone increased from \$5,976,000,000 in December, 1920, to \$9,784,000,000 at the beginning of 1930. In addition to the expansion of the resources of commercial banks, resources of savings banks rose from \$5,557,000,000 in 1915 to \$11,816,000,000 in 1930. Likewise the assets of life insurance companies increased from \$5,190,000,000 in 1915 to \$17,482,000,000 at the beginning of 1930. Life insurance investments in bonds increased from \$2,094,688,000 in 1915 to \$5,923,889,000 in January, 1930.

On the supply side there was a vast amount of new bonds floated. In the decade 1920-1930, \$30,875,000,000 of new corporate issues were floated, about \$10,000,000 of municipal issues, \$5,000,000,000 of foreign bonds, and about \$1,250,000,000 bonds of the Federal Farm Loan System, all issues totaled \$47,125,000,000. From this sum must be deducted \$9,300,000,000 for the redemption of the federal debt, leaving net issues of \$37,825,000,000. This is a huge amount of securities but the figures are not so impressive as those on the demand side. Moreover, they do not take account of elimination of any except United States debts during the decade.

Major Cycles in Bond Prices.—Changes in the demand for and supply of investment funds are greatly influenced by business conditions. In periods of business depression and stagnation, as well as in the early period of revival, there is invariably an accumulation of investment funds. Confidence in the future is lacking, and there is correspondingly little incentive for business expansion; it is rather a period of retrenchment. Interest rates are high, commodity prices low, and speculation at low ebb. This is the time when certainty is sought by investors. Circumstances favor safe investing, for following the liquidation of the preceding period bond prices are low and there is every incentive for investors to place their money where a comparatively large return can be secured. Bank loans are also low with reference to deposits, and surplus funds are invested in good securities with high yield. On the other hand, the supply of securities is exceptionally small in such periods. Individual investors disposed of their bonds in the previous periods of prosperity, strain, and crisis. Likewise, many business concerns during those periods found it necessary to dispose of their holdings. These forces resulted in forcing down the prices of high-grade bonds to the favorable figures shown in the period of depression. The result is that in periods of depression and early revival, demand for high-grade securities outruns the supply at the current price. With the equilibrium thus disturbed, prices of bonds move upward, seeking adjustment to the new situation.

After business has returned to normalcy, succeeding the period of depression and early revival, the future takes on a different hue and optimism begins to prevail. Commodity prices begin to advance, the volume of business increases, and speculation revives. These forces turn the current of investment funds in the opposite direction and bond prices reverse their movement, starting downward. Individual investors who had previously bought for safety now see a profit on their commitments and are attracted by prospects of business profits. They accordingly dispose of their bonds and invest the proceeds in more speculative securities which promise high dividends and material increase in the market price. Well-managed business concerns, which during

the preceding period had invested their idle funds in bonds, now have need for their capital and accordingly dispose of these securities at a profit. The proceeds are spent in expanding their business in order to take advantage of the coming period of prosperity. Banks have an increased demand for their funds from business and find it expedient to reduce their portfolio of bonds. The result of these forces is that an unusually large supply of securities is thrown on the market which proves to be more than the demand can absorb at prevailing prices, and the bond market thus moves downward. During the succeeding periods of prosperity and strain, these forces are accentuated, causing a continuance of the downward movement, which usually ends with the crisis period but sometimes shortly afterwards. Commodities are liquidated, prices fall, business slumps, and the financial markets are turbulent. Soon thereafter bond prices again start upward, repeating their previous movements.

The chart of business conditions prepared by Dr. Persons shows that in the period from 1903 to 1913 inclusive, there were three complete business cycles. The movements of bond prices during these three periods are closely correlated with business. In every case whenever this line reaches normalcy—the zero line—there is a cyclical turn in bond prices. When the index line reaches the zero line on its way downward, bond prices turn upward; and when the business line crosses the zero line on its way upward, bond prices turn downward. Thus bond prices turned upward in August, 1903, in November, 1907, in July, 1910, and again during the summer of 1913, at the beginning of the period of depression starting the fourth cycle. On the other hand, bond prices started downward in August, 1905, in April, 1909, and in December, 1911. The duration of these periods was as follows:

Advancing	August, 1903, to August, 1905	24 months
Declining	August, 1905, to November, 1907	27 months
Advancing	November, 1907, to April, 1909	17 months
Declining	April, 1909, to July, 1910	15 months
Advancing	July, 1910, to December, 1911	17 months
Declining	December, 1911, to May, 1913	17 months

Forecasting Bond Prices.—Efforts to forecast the cyclical movements of bond prices by means of the bank rate of interest have failed. Out of nine major turns in the yield of 10 American railroad bonds during the periods 1903–1914 and 1919–1921, in 3 cases the average yield on 4- to 6-month and 60- to 90-day commercial paper reversed itself at precisely the same month as the bond yield, in one case the bank rate was but 1 month ahead of the turn in the bond yield, and 2, 3, 5, and 11 months in advance in the remaining instances, except one, when the bank rate lagged 1 month behind the bond yield.

From August, 1914, till November, 1915, money rates moved steadily downward. The bond yield moved definitely downward after August, 1915, or 10 months after the bank rate turned. In November, 1915, bank rates again started upward, followed 13 months later, in December, 1916, by the bond yield. During the early war period, therefore, bank rates preceded by 10 to 13 months the movements in bond yield. As a forecaster, therefore, the bank rate has proved unreliable, the results rather suggesting that there are common causes for the movements of bank rates and yield on bonds.

The War Period—It is difficult, if not impossible, to account for all of the influences affecting bond prices during the war period. The outbreak of the war came, however, in the midst of depression in the United States. The liquidation of bonds from foreign sources appears to have begun already in May, 1914, when prices turned downward. The volume of transactions was specially heavy preceding the outbreak of the war. In the 7 months of 1914, during which the Stock Exchange was open, the par value of bonds sold amounted to \$461,898,100, which compares with a low of \$501,155,920 for the 12 months of 1913, which came at the end of a steady decline in annual transactions since 1909. In 1915 after the exchange was again opened, transactions amounted to \$956,077,700, which increased during 1916 to \$1,161,625,250. The rise of bond prices from August, 1915, to the end of 1916 can be explained in no other way than by the fact of exceptional prosperity in the United States as a result of the great demand for products from Europe and the consequent accumulation of funds for investment purposes.

By the beginning of 1917, however, other forces turned the current strongly the other way. While commodity prices had already advanced considerably by the end of 1916, the rise after this was much more strongly upward through 1917. The cumulative effect of rising prices of commodities manifested itself in a correspondingly greater demand for funds for the expansion of business. The actual entrance of the United States into the war caused a withdrawal of investment funds through bond sales. During 1918 bond sales increased to over \$2,000,000,000, which, together with the flotation of tax-free Liberty bonds, accounts for the decline in the prices of that year.

Bond Cycles since 1920.—Since 1920 two distinct major cycles in bond prices have developed. The first corresponds to the business cycle of 1921-1924 and the other extends from 1924 to 1929. Bond prices, like stock prices, ignored the minor depression of 1927. The general reasons for this were especially the mild character of the depression of 1927 and the strength of the forces for advancing security prices noticed in the preceding section.

True to their pre-war form, bond prices turned up in the middle of 1920 at approximately the point where the business index crosses the

normal line on its way downward, they turned downward in the latter part of 1922 at the time when the business index crossed the normal line on its way upward. Prices again turned definitely upward when the business index crossed the normal line on its way downward. The peak was again reached at the end of 1927 when the business index crossed the normal line upward. Prices turned upward once more in the latter part of 1929 when the business index crossed the line downward, but they did not continue upward to the point of revival, instead the market experienced the most violent cataclysm in its history.

The Cataclysm of 1931.—This experience is definitely attributable to the breakdown of international credit and the destruction of confidence, so that prices in 1932 again reached the depths of 1920. This was a period when American banks were sorely tried in meeting their short-time obligations to Europe. In the fall of 1929 foreign balances in the United States markets reached \$3,000,000,000. Within the next 2½ years the banks were called upon to liquidate \$2,250,000,000 of these credits, the task having been finally completed in June, 1932. This gigantic task was accomplished by aid of the Federal Reserve System and with the net loss of only about \$400,000,000 in gold. From September, 1931, to June, 1932, however, the loss of gold through shipment and earmarking amounted to about \$1,500,000,000. Banks raised large sums by selling their bonds and the precipitous decline in prices followed. This movement, like the business cycle itself after 1930, was wholly abnormal in character. The dependence of foreign countries in the future on the gold exchange standard will be far less than during the past decade, the dangers of such a widespread system will also be avoided and financial affairs may once again return to their normal course, provided only that reparations and interallied debts are sunk and there is not too great political interference in international economic affairs. American banking and business were never more liquid than in 1932 and this augurs well for the future, only if abnormal developments do not again upset the normal development of the cycle.

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CHAPTER XXXIX

STOCK PRICES

No subject in the field of finance has received more study within recent years than the subject of stock prices. This was occasioned undoubtedly by the good account that stocks gave of themselves prior to 1929. The universal awakening of interest in this class of security was the motivating force back of the studies. While attempts to fathom this subject have recently slackened, interest has by no means vanished. Nor is there any reason to believe that the public interest in the ownership of stocks has waned. On the contrary, there is the strongest kind of evidence that public interest in this class of security continued to broaden as the business depression grew more severe. A recent investigation of R. G. Dun and Company showed that common stockholders in 346 leading corporations in the United States in the years 1930 and 1931 (approximately) increased from 4,133,267 to 5,847,651, an increase of 41.5 per cent. Not one group of companies in the entire list showed a decrease. The greatest increase was in retail merchandising, amounting to 75.9 per cent, the smallest was in leather and shoe manufacturing, amounting to 3.7 per cent. This universal interest in common stocks insures renewed interest in the problem of common-stock prices in the future.

Studies within the past decade have been largely statistical in character. Statisticians have apparently exhausted every possible avenue of attack in an effort to discover some mathematically valid relation between stock prices and other series of data. In this they have imitated other studies relating to the solution of the problem of business cycles. They have sought to establish definiteness between stock prices and earnings, dividends, bond prices, time-money rates, purchasing power of money, turnover of bank deposits, volume of production, gold movements, and so forth. No great measure of success has attended these efforts. Failure is attributed to the nature of the problem itself rather than to any shortcomings in statistical technique. Stock prices, in the nature of the case, must always be the result of countless economic, political, social, and psychic forces, most of which are not susceptible to statistical treatment. This chapter is an endeavor to present certain fundamental forces that combine to produce what may be called stock-price movements as distinct from absolute prices. The direction in which prices will move may be determined with comparative certainty, but not the exact extent of the movements themselves.

Value and Price.—The study of stock-price movements may best begin with a restatement of the principles of value already elaborated. One must recall again that the sole service of capital is the income which it yields. Stocks and bonds are alike in at least one respect, namely, in that they are merely the representatives of invested capital, both classes of securities derive their inherent value from the services of the capital which lies back of them. But bonds and preferred stocks are different from common stocks in that their income is fixed or limited in amount (neglecting for present purposes participating features). Common stocks are entitled to residual income from capital after all other expenses and deductions are made. Furthermore, no income is available to the common stockholder until charges for depreciation and the like, sufficient to preserve the original investment intact, are allowed from annual earnings. In these circumstances is found the chief characteristic of common stocks, namely, the fluctuating character of their earnings.

In the discussion of bond prices the principle was developed that present values are merely the discounted value of future payments, and that if the latter were known, as they are in the case of bonds, values could be determined by mathematical computations. This gives us the starting point for stock values also.

Stock Values.—Stock values are no different in nature from bond values. They too are the present values of future payments to the stockholders. As in the case of perpetual bonds, stock values may be found by capitalizing the future income to their owners.

This statement, however, must be qualified at the outset by making allowance for the uncertain character of the future return to stockholders. Yet for most common stocks this qualification is not so serious as it appears at first sight. The risk factor is regularly compensated for by allowing an addition to the pure rate of interest sufficient to meet the exigencies of the case, the same as is done in bonds and preferred stocks of inferior quality. In estimating future earnings, it is not necessary that the earnings of each year be estimated with any accuracy. Indeed this is impossible. It is sufficient to estimate the earnings in the long run. Here one has past experience as the guide. The amount and trend of earnings in the past are available for most concerns. Inaccuracies in accounting, to be sure, often defeat the best of efforts in the study of past earnings but at this juncture this factor must be wholly neglected. Having determined past earnings and trends, modifications must be made to allow for changing conditions, if any, these also may be uncertain but they constitute the only approach open. In a great majority of the cases an intensive study of the situation will enable one to forecast with a reasonable degree of accuracy minimum expected earnings.

In building up an estimate of future earnings, the best that can be done in practice is to fix a figure for average results rather than for

particular years. This average then forms the basis for capitalization at a rate of interest suitable to the risk involved. The method may be illustrated by the example of the American Telephone and Telegraph Company. Average earnings of this company for the decade 1922-1931 were \$11.35 per share. The steadiness of annual earnings during this period, in the face of wide variations in general business conditions, indicates that the average for the next 10-year period may not be very different. Assuming then that nothing of exceptional character appears at the present time to alter the fundamental position of the telephone industry in the future, one may capitalize these earnings at a relatively low rate, say, 6 per cent (5 per cent for interest and 1 per cent for risk). The price indicated by this calculation is \$189.17 per share. This then represents an assumed value of the stock based upon conditions reasonably assumed. As long as fundamental conditions in the industry do not change, this figure may be taken as the constant value of the stock regardless of market fluctuations in price.

Fluctuations in the Interest Rate.—In the above illustration 5 per cent was assumed as the average rate of interest on long-time obligations. But the interest rate is constantly changing, although it seldom departs far from the average for short periods. These fluctuations in the rate of interest undoubtedly in practice influence the rate of capitalization. One may assume that the differential of 1 per cent for risk in the example remains approximately the same. A departure of one-half of 1 per cent in the rate of interest would find a corresponding change in the rate of capitalization and hence in the price of the stock.

Earnings versus Dividends.—A troublesome question arises in connection with dividends. In the above discussion the value of stocks has been related to earnings. Some investigators, however, start with dividends and seek to establish a relation between this variable and stock values. The stockholder, like the bondholder, purchases income, but all of the earnings are not directly realized by him. Corporations on the average retain about 40 per cent of their earnings as surplus. Although this portion of earnings is not realized by the stockholder, it stands as a reinvestment for him in the corporation and is earmarked as surplus in the balance sheet. It is as though the stockholder had received his entire portion of the earnings and subsequently reinvested it in additional property of the corporation. As such it will result in larger per share earnings in the future. This vicarious investment for stockholders should not divert attention from the fundamental fact that investment in stocks is merely the purchase of future income, represented primarily by the earnings of the corporation. The measurable success attained by attempting to establish a definite relation between price and dividends is due to the comparative uniformity of the 60 per cent ratio among corporations.

What, then, is the influence of dividends on price? The answer is that they are practically without influence on the mathematical or statistical value of stocks, since the payment of dividends is without influence upon earnings, upon which these values are based. There is, however, an influence upon the price. Stockholders, after all, are human beings and are swayed by the personal advantage of a realized over an unrealized income. Of two stocks with identical earnings, records, and prospects, but the one paying a larger dividend than the other, the former will undoubtedly command a higher price merely because stockholders prefer present to future values. Myopic vision plays a part in the price-making process. Stockholders often act upon the principle that a bird in the hand is worth two in the bush and for this reason are willing to pay a premium for the stock with the higher dividend rate, just as they discount the one with the lower rate.

The type of dividend has its influence on price also. If the dividend is regular and higher than the ordinary expectations, the stock will sell constantly at a premium over those of lower dividend rate. But if the additional distributions to stockholders are irregular in character, as when extras are paid, the price will fluctuate as the prospects for extra payments fluctuate. In case of the irregular or occasional stock dividend, past earnings are distributed through payments in stock which carries a dividend the same as the old stock, with the result that the annual distributions thereafter represent an increase to the old stockholders. This usually results in a permanent rise in the market value of the holdings, although the per share value will depend upon earnings and dividends per share under the new situation. In case of large stock dividends the annual rate of earnings per share thereafter may actually be reduced (this, however, is not common), in which case both the value and price of each share will suffer.

Relation of Price to Current Earnings.—In the determination of value, average earnings were taken for convenience of calculation and fluctuation of earnings from year to year was neglected, since total earnings over a period of time would remain unaffected by this factor. But in the determination of price as distinguished from the mathematical or statistical value, fluctuations in earnings are of the highest importance. Current earnings are perhaps the most important influence in current prices. Where annual earnings are constant in amount, value and price are identical, but where earnings fluctuate from year to year, price departs from value in a corresponding degree. The market tends to capitalize current earnings just as it employs current interest rates in the capitalization process. These facts account for the wide variations in the price of United States Steel, for instance, when compared with that of the American Telephone and Telegraph Company. Earnings on both the preferred and common stocks of the former vanished entirely in 1932,

when the stock sold around \$25 per share, the same stock earned \$21.19 per share in 1929 and sold at \$260. The more recent price thus represents a decline of 90 per cent from the peak in 1929. Yet over the past 10 years (1922-1931) earnings on United States Steel averaged \$11.35 per share. A broader basis for comparison is obtained by taking earnings and prices of representative stocks. The industrial stocks of one well-known set of averages in the period 1900-1931 (September) shows a range in the price-earnings ratio of 5.9 in 1903 to 26.7 in 1929. As late as 1924 this ratio was as low as 6.2. It now stands at the lowest figure since 1900.

Discounting Process.—Current earnings have been spoken of as the chief determinant in current prices. This statement is not literally true owing to the fact that the market constantly attempts to discount the future. The extent to which this is attempted, however, is limited to several months at the most. The habit of corporations in reporting quarterly earnings makes this period the normal one for the discounting process. Discounting is a phenomenon of speculation rather than of investment. It represents the efforts of the professional speculative fraternity to forecast the future and so to take advantage currently of the near-future results of business operations. In the case of anticipated increase in earnings, professional bulls attempt to accumulate stocks prior to the time when the facts become public knowledge and to dispose of them when the news is out. In case of anticipated decline in earnings, professional short sellers, or bears, attempt to sell in the earlier period and repurchase when earnings are known to have declined. Current prices, therefore, represent the prospects of the near future, rather than present earnings.

It should be observed, however, that the estimates of the professional element are often mistaken. One needs only to point to the misguided estimates both in the early spring and summer months of 1930 and 1931, when market prices indicated improvement in spring and fall business which was not realized. Such mistakes are common in bear markets and they testify to the limitations upon the knowledge even of the insider in the market.

Market Factors.—Aside from the mathematical or statistical factors in price, several market phenomena are of importance in determining the peaks and valleys, the excess of prices in each direction. The chief market factors are (1) psychic influences, (2) the money market, (3) the capital market, and (4) short selling.

Psychic influences operate in those periods when human emotions displace human reasoning. There are times, often protracted in length, when efforts are no longer made to relate stock prices to anything of tangible nature. The most dominant influence in the market at such times is in advancing or declining prices themselves. These movements

may be observed at the end of a bull or bear market. At the peak of a market movement optimism prevails, speculation for the advance is universal, and brokerage houses are filled to standing room. At such times reason has been left behind and advancing prices absorb the entire attention of the public. Profits are quickly made on rapid turnover. At the opposite extreme are declining prices toward the end of a bear market. The public now is extremely pessimistic. Buying power has vanished and the market pursues its unending downward course, losses are staggering and gloom becomes impenetrable. These two extreme manifestations of emotions correspond to the "errors of optimism" and "errors of pessimism" manifested on similar occasions in the business world.

But periods of excess are characterized also by influences in the money and capital markets. Toward the peak of the advance, speculators find money and capital abundant. Optimism is fed upon expanding stock loans from banks, business corporations, or individuals. Easy money thus lends its influence toward the excesses of the bull movement. On the other hand, toward the end of the decline in stock prices, money and capital markets become tight, with the result that funds for normal uses or for the payment of debts contracted in the previous period of prosperity or otherwise are difficult to obtain. At such times holders of stocks, and bonds, too, find it necessary to part with their investments in order to raise money, since the usual sources of income have been depleted in part at least. Liquidation becomes general and without the support of buying orders, prices sink lower and lower, loan margins at the banks become progressively impaired, thereby forcing the unfortunate borrowers to dispose of their thinly held stocks. The extent of this process cannot be predicted with assurance, but prices are forced farther and farther below any tangible measure of values.

To the fears of the public and necessitous liquidation are added the bitter dregs of short selling and bear raiding. Short selling and bear raiding are made more vicious because they appear just at the critical juncture when the market appears to be making progress in reversing its trend. This subject is discussed toward the end of this chapter.

Price-earnings Ratio.—The combined effect of psychic influences, the money and capital markets, short selling, and bear raiding is to disturb the ratio of prices to current earnings, the acknowledged market guide. This last benchmark of prices itself is forgotten in the downward plunge. Consider further the example of the American Telephone and Telegraph Company. During the first half of 1932 this company was earning at the approximate rate of \$9 per share on its stock. If this were capitalized at the rate of 6 per cent, the price would have remained around \$150 per share, instead, it sank to approximately \$80 per share, or \$70 below this figure and \$100 below the mathematical value based upon average earnings. At the height of the boom in 1929, the other extreme is repre-

sented, when the stock sold at approximately \$300 and earned \$12 67 per share. If one capitalizes these earnings at 6 per cent, the price should have been \$211, or \$89 below actual prices; the mathematical value itself was \$111 below the actual price.

In the light of these experiences there appears to be no normal price-earnings ratio for common stocks. The price delusions of the "new era" period of finance may well be interred in the grave of oblivion. Furthermore, the conventional 10 to 1 ratio appears to have no logical basis in fact or in theory. There is, however, a normal value-earnings relationship. This may be obtained by simply multiplying the average earnings by the factor indicated by the rate of capitalization suitable for the particular case at hand. In the case of the American Telephone and Telegraph Company it appears to be something like 16½%.

Stock Price Cycles.—Price movements in the stock market can best be understood in the light of the above analysis. It may be pointed out that the forces underlying these movements are partly inherent in the nature of equity securities, they are partly due to the money and capital markets and hence external to these issues; and lastly they are psychic in nature. The interaction of these forces produces regular and orderly movements in prices. A study of these movements should go far toward dissipating the bewilderment that usually seizes the observer of the market page of the daily newspaper.

Stock prices move in well-defined cycles. A cycle is composed of two movements, the one upward and the other downward. The upward movement generates forces that ultimately undermine its advance and bring about a reaction in the opposite direction of something like the same proportions.

There are three well-defined cycles in security prices which are simultaneously working themselves out. Every orderly movement in the market is the manifestation of a phase of one or more of these cyclical movements. They may be named the great cycle, the major cycle, and the minor cycle. While all three are in progress continuously, they develop independently of each other, operating, as it were, as wheels within wheels.

Major Cycles in Stock Prices.—Between the major depressions in business, minor depressions develop and these are almost universally accompanied by major cycles in stock prices. The one important exception to this was in 1927 when the financial markets ignored the minor business depression. It appears from the chart that 15 well-defined cycles have run their course since 1877. The average period of the major cycle has been approximately 3½ years each. The longest cycles were from 1877 to 1884, or 7 years, and 1924 to 1932, or 8 years; the shortest began in December, 1917, and ended in February, 1919, covering a period of only 15 months. Major cycles vary greatly in intensity and correspond largely to the severity of the business cycle.

The primary cause of both the great cycle and the major cycle seems without doubt to be fluctuations in business conditions. With the fluctuations in annual earnings, stock prices tend to adjust themselves accordingly. The peaks and valleys of stock prices develop through the influences of the market forces noticed in the preceding section. Stock prices at their peaks often turn down months before business begins its decline. But in 1887, 1893, 1899, 1902, 1916, 1918, and 1929 stock prices either coincided with the turn in business or followed it by a short interval. Only in exceptional instances is the turn in stock prices of sufficient priority or the decline of sufficient intensity to act as a fore-caster of the decline in business. Much the same may be said in regard to the reversal of trend at the bottom. It appears that business conditions and stock prices move together oftener than otherwise.

Phases of Major Cycles.—In speaking of stock price movements, it is common to speak of only two phases, namely, advance and decline, or bull and bear markets. This practice is not entirely justified, the evidence of the averages shows that there is no regular pattern which will apply to all cycles alike. It is quite common, for instance, for prices to hesitate at the peak or move in confusing fashion for months at a time, the next move being entirely unpredictable, since there is no known method of foretelling the time when the trend will change. For instance, in 1872-1873 a series of four peaks of approximately the same height and extending over a period of about 8 months occurred. Again in 1899 three peaks of about the same duration appeared. At the top of the cycle in 1906 stocks moved uncertainly until the beginning of 1907 when the decline set in. In 1929 the various indexes differed somewhat but most of them showed a sharp peak just before the panic set in. Similar observations may be made with reference to the bottom of the market, but here sudden reversal is more likely to characterize the end of the bear movement. The only important exception to this appeared in 1884 and 1885 when a double bottom was made. The tendency for average prices to enter a waiting period at the top and the bottom is due partly to the general uncertainty of the time and partly to the tendency for different groups of stocks to reach their turning points at different times. No general rule can be laid down with reference to the rapidity of the advance or decline. Sometimes the major part of the advance or decline seems to be made in a relatively short period of time, while at other times it is more nearly uniform during the entire movement. The advance, however, is almost invariably longer in duration than the decline and the latter more precipitous than the former.

Great Cycles in Stock Prices.—Great cycles in stock prices are the longest cycles that can be discovered in the statistical averages of railroad and industrial stocks. By examination of business and stock price charts, one may discover that great cycles in stock prices coincide roughly

with the major periods of prosperity and depression in business. By reference to the Index of Industrial Production and Trade, eight severe business depressions mark the period since 1875. In between these depressions periods of uneven prosperity, marked only by minor depressions, prevail. The indexes for both railroad and industrial stock prices reveal similar cycles. The periods in between the low points reveal minor recessions, which correspond roughly to the minor recessions shown in the business chart. Great cycles in stock prices since 1875 are marked as follows:

1877 to 1885	1907 to 1914
1885 to 1893	1914 to 1921
1896 to 1907	1921 to 1932

The movements of railroad and industrial stock prices are strikingly similar in these six cycles. They do not always move in equal amplitude, however. In the first cycle the advance in industrial stock prices was much greater and subsequent fall considerably less than in the case of railroads. In the cycle from 1896 to 1907 railroad stocks advanced much farther than industrial stocks, while in the two cycles from 1914 to 1932 industrial stocks again advanced much farther than railroad stocks.

Trends.—Trend is a flexible term. It implies something fundamental or basic in character, yet it has meaning only in a relative sense. Trend is basic in importance only in the sense that it is more basic than other manifestations. In the chart on stock prices numerous trends are easily discovered. The most obvious of these is the upward trend for the entire period. The same chart may be broken into several segments and trends of shorter duration discovered. For instance, the period 1877–1896 shows a horizontal trend. Likewise the periods 1904–1914 and 1914–1932 show horizontal trends. When the period is thus divided into three segments, one gets three price zones corresponding to the different periods. This is not to say, however, that stock prices showed important advances between the first and second and between the second and third zone. Whether this is true or not depends upon the appropriateness of the data upon which the chart is based. And this observation applies to all financial data.

Important trends of lesser duration are found within each zone above designated. For instance, the period 1877–1881 shows a strong upward movement which forms one phase of the great cycle previously noticed. Likewise the period 1921–1929 shows a very strong trend upward and is likewise one phase of the great cycle terminating in 1932. But these movements are designated as trends only because in each case minor movements are in evidence. Usually when the term “trend” is used in stock market analysis, it refers to the main upward or downward movement of the stock cycle. For instance, in the great cycle from 1885 to

1893, three upward and three downward trends corresponding to major cycles are in plain evidence. In the great cycle from 1914 to 1921, two upward and as many downward trends of major cycles appear.

• But this does not complete the story of trends. Minor trends occur during the course of a major trend. These are plainly discernible during the major downward trend following 1929; an upward trend of several months' duration developed in the early months each of 1930 and 1931. If one cares to push the matter still farther during each of the two upward trends just referred to, minor downward trends of a week or more may be found. These are trends in the sense that they are more fundamental than the daily fluctuations during the period.

The period chosen for the trend is almost wholly arbitrary and the inclination of the trend line is materially affected by the limits of the period chosen. Indeed a trend suitable to the purposes of the calculator can be established to prove almost anything desired. But true trends must always be established by the economic and financial appropriateness of the periods chosen. For instance, it would be inappropriate to break up the period following the war arbitrarily in order to obtain desired statistical results. This period is economically a unit and should be thus considered. Nevertheless, prior to its logical completion some statisticians were establishing stock price trends beginning in 1921 or earlier. The result was only deception.

Fundamental Factors in Trends.—The most prominent and far-reaching movements in the stock market are the bull and the bear movements of the major cycle. Furthermore, the most important phase, the time of greatest advance, in the upswing of the great cycle corresponds with the upswing of the major cycle beginning at the same time. Likewise the most important decline in the market is found at the end of the great cycle and corresponds to the downswing of the current major cycle.

The fundamental factor in the major trends must always be the earnings of corporations. As long as these are increasing, there is a firm basis for advancing stock prices; conversely, declining earnings are certain to be accompanied by declining stock prices. While these observations are the most fundamental that can be made on the movements of major cycles in stocks, they are not sufficiently accurate for predicting the reversals of the trend. This is because of the infrequency of reported earnings as well as the inexact nature of accountancy.

The second major factor in price trends is found in the money and capital markets. These markets are to a large extent mutually dependent and hence should generally be regarded together when stock market trends are under consideration. While there must be the positive incentive of advancing earnings in business before any decided advance in stock prices can be expected, it is nevertheless true that improvement in business and the stock market is conditioned upon a satisfactory situa-

tion in money and credit. The converse is equally true, namely, that both business and the stock market are adversely affected during periods of unsatisfactory money and credit conditions. In a sense, then, money and credit conditions are of basic importance to both business and stock prices. It follows that, when there is a fundamental change in money and credit conditions, both business and stock prices will change their trends also. One saving qualification is that there occur readjustments in business between costs and selling prices which are followed by a turn in profits. The normal working of the competitive system has always brought about such adjustments both at the top and at the bottom of major trends in business.

Forecasting Stock Prices.—Granted then that readjustments are normally made within business processes and that general money and credit conditions have experienced a fundamental change, forecasting of stock prices becomes a matter of establishing exact relationships that exist within the money and capital markets themselves. For this purpose one has to consider separately the money market in the narrow sense of the term, the bond market, and the stock market.

Banks do not deal in stocks; hence there is no direct relation between money rates and stock prices, but there is an indirect relation through collateral loans. When the demand of business for bank funds is pressing and funds are scarce, collateral loans are discouraged and money on call may even be reduced. These processes discourage the further purchase of stocks, with the result that prices either are halted or actually decline. When money rates are easy and funds abundant at the bottom of a business depression, collateral loans, especially brokers' loans, are easily increased as a method of employing surplus bank funds. The process is helped along by the high yield of stocks when prices are at the bottom and by the low yield when they are at the top.

The extent of the rise in the interest rate necessary materially to influence stock prices is uncertain. Professor W. L. Crum of the Harvard Economic Service settled upon a $1\frac{1}{4}$ per cent rise as sufficient in forecasting stock prices. He found that when such a rise occurred it gave a strong indication that the advance in stock prices was nearing the end. The time elapsing before the decisive downward trend begins is usually from 6 months to a year or more. If one takes commercial paper rates as the best available index of bank rates, one may observe that, when commercial paper rates rise to $4\frac{1}{2}$ per cent, it is usually a warning that the end of the upward trend in stock prices is near at hand. Any rise above this point makes the forecast more certain. Since stocks do not wait long before reversing their trend, this observation has great value in forecasting downward trends in stock prices.

At the bottom of the stock price cycle the turn in the interest rate generally coincides with the termination of the decline in stock prices.

But when interest rates begin to fall rapidly, it is quite certain that the downward trend in stocks is rapidly approaching the end. Falling interest rates have generally encouraged bull markets. Beyond these rather elementary observations it is generally unsafe to go. Most of the carefully devised and complicated stock market prognosticators are unsafe.

Bond Prices and Stock Prices.—In considering the relation of bond prices to stock prices, it will be in order first to brush aside a popular, or Wall Street, superstition, namely, that bond prices and stock prices move in opposite directions. Observation of charts extending over the past 50 years will most effectively remove this hallucination. The plain fact with reference to major cycles is that they move together most of the time.

There is a theoretical reason, however, why the turn in bond prices may be expected to precede that of stock prices. At the bottom of a business depression confidence in everything is at low ebb and it is reasonable to expect that reviving faith in business and finance will first express itself in rising bond prices, since they contain less of the risk element than common stocks. Conversely, at the top of the business cycle confidence in stocks is at the maximum, with the result that investors then throw their bonds overboard and assume the greater risks of stocks. Thus bond prices may be expected to decline sometime before stock prices.

In discussing the relation of bond prices to stock prices, it is best to take the prices of prime bonds, since these are not materially influenced by business profits. The ordinary bond price index includes second- and third-rate bonds which are more or less influenced by the state of business profits and hence are not very sensitive to money and credit conditions. The decisive reason for selecting prime bonds is that they are dealt in extensively by the commercial banks. They form the secondary reserve of commercial banks, they are purchased with the banks' surplus funds and are disposed of when banks are in need of additional funds to accommodate business demands. When confidence in business is at low ebb, bonds furnish a safe investment for banking funds. Thus when business is at low ebb and banks have surplus funds on hand, interest rates are low and a better return is sought in the purchase of prime bonds whose price in turn responds to the increased demand. At the top of the business cycle when the demand of business for funds is great and the interest rate is high, banks seek to profit by disposing of their bonds, usually at an advance over the cost price. The result is that bond prices decline.

In practice it is found that at the peak bond prices are a dependable guide to stock prices and are of equal value with short-term interest rates. When the two confirm each other, the result is reasonably certain. The same relationship, but with a lesser lag of stock prices, is found at the bottom of the cycle. Half a century of market experience has shown

that on the upswing in no case have bond prices continued to rise as long as stocks, the interval generally being 4 to 8 months. Except for the abnormal years of 1895 and 1916, stocks always continued to advance as long as bonds were advancing, and they have always continued their advance for some time after bond prices ceased advancing. Furthermore, with the exception again of 1895 and 1916, bonds always began their decline before stocks, generally 5 to 7 months in advance. Thus failure of bonds to decline is an almost certain indication that the decline in stocks is yet some months away. On the other hand, it has been observed that a 3 months' decisive decline in bond prices forecasts rather accurately an early decline in stock prices.

Dow's Theory—The method of forecasting by establishing fundamental relationships between stock prices and other series of data may be supplemented by analysis of the technical action of the market itself. One is indebted to Charles H. Dow of the *Wall Street Journal* for the first scientific analysis of price movements in the stock market. In 1922 William P. Hamilton, of the same publication, assembled and interpreted the various parts of the Dow theory for the first time. A still more analytic summary appeared in *Barron's* for June 13, 1932, by Robert Rhea. His summary (with unimportant omissions) follows:

Dow's Three Movements—There are three movements of the averages, all of which may be in progress at one and the same time. The first, and most important, is the primary trend—the broad upward or downward movements known as bull or bear markets, which may be of several years' duration. The second, and most deceptive, movement is the secondary reaction—an important decline in a primary bull market or a rally in a primary bear market. These reactions usually last from 3 weeks to as many months. The third, and usually unimportant, movement is the daily fluctuation.

Primary Movements—The primary movement is the broad basic trend generally known as a bull or bear market extending over periods which have varied from less than a year to several years. The correct determination of the direction of this movement is the most important factor in successful speculation. There is no known method of forecasting the extent or duration of a primary movement.

Primary Bear Markets—A primary bear market is the long downward movement, interrupted by important rallies. It is caused by various economic ills and does not terminate until stock prices have thoroughly discounted the worst that is apt to occur. There are three principal phases of a bear market: the first represents the abandonment of the hopes upon which stocks were purchased at inflated prices; the second reflects selling due to decreased business and earnings, and the third is caused by distress selling of sound securities, regardless of their value, by those who must find a cash market for at least a portion of their assets.

Primary Bull Markets—A primary bull market is a broad upward movement, interrupted by secondary reactions, and averaging longer than 2 years. During this time, stock prices advance because of a demand created by both investment

and speculative buying caused by improving business conditions and increased speculative activity. There are three phases of a bull period: the first is represented by reviving confidence in the future of business, the second is the response of stock prices to the known improvement in corporation earnings, and the third is the period when speculation is rampant and inflation apparent—a period when stocks are advanced on hopes and expectations.

Secondary Reactions—For the purpose of this discussion, a secondary reaction is considered to be an important decline in a bull market or advance in a bear market, usually lasting from 3 weeks to as many months, during which interval the price movement generally retraces from 33 to 66 per cent of the primary price change since the termination of the last preceding secondary reaction.

Both Averages Must Confirm—The movements of both the railroad and industrial stock averages should always be considered together. The movement of one price average must be confirmed by the other before reliable inferences may be drawn. Conclusions based upon the movement of one average, unconfirmed by the other, are almost certain to prove misleading.

Determining the Trend—Successive rallies penetrating preceding high points, with ensuing declines terminating above preceding low points, offer a bullish indication. Conversely, failure of the rallies to penetrate previous high points, with ensuing declines carrying below former low points, is bearish. Inferences so drawn are useful in appraising secondary reactions and are of major importance in forecasting the resumption, continuation, or change of the primary trend.

Lines—A "line" is a price movement extending 2 to 3 weeks or longer, during which period the price variation of either average does not usually exceed approximately 5 per cent of the price of that average. Such a movement indicates either accumulation or distribution. Simultaneous advances above the limits of the "line" indicate accumulation and predict higher prices; conversely, simultaneous declines below the "line" imply distribution and lower prices are sure to follow. Conclusions drawn from the movement of one average, not confirmed by the other, generally prove to be incorrect.

The Relation of Volume to Price Movements—A market which has been overbought becomes dull on rallies and develops activity on declines; conversely, when a market is oversold, the tendency is to become dull on declines and active on rallies. Bull markets terminate in a period of excessive activity and begin with comparatively light transactions.

Double Tops and Double Bottoms—"Double tops" and "double bottoms" are of but little value in forecasting the price movement and have proved to be deceptive more often than not.

Individual Stocks—All active and well-distributed stocks of great American corporations generally rally and decline with the averages, but any individual stock may reflect conditions not applicable to the average price of any diversified list of stocks.

The Dow theory runs in terms of movements in one direction only. Whenever counter movements appeared which reversed for a time the normal trend, they were thought of as temporary "reactions" which would soon be overcome by the resumption of the main movement. A primary bull movement occasioned by the advancing business prosperity

was temporarily interrupted by a "reaction," while a primary bear movement was often accompanied by a "recovery," "reaction," or "rally" upward. These "reactions" were thus counter movements which constituted no part of the major movement and were in the nature of breaks in the primary movement. Likewise, daily fluctuations were only inconsequential breaks in the primary or secondary movement.

Stock Price Averages.—Stock price averages are constructed by numerous organizations, each attempting to produce a series of averages adapted to some special purpose or purposes. Most stock price averages, however, are designed to show speculative movements in the market. This is the case with the oldest and most widely used averages, the Dow-Jones averages. The 30 industrial stocks of this group (formerly 20 and 12) are selected on account of their speculative qualities with distribution among the representative industries. They doubtless serve admirably the purpose of gauging speculative movements. But on account of the many changes made in the stocks composing the average, they tell nothing about long-time trends; unless caution is exercised one may easily reach erroneous conclusions as to the profitableness of stock-holdings over long periods of time. A new average constructed for the *Barron's* magazine changes the stocks weekly so as to include stocks currently the most active. This average is perhaps the best now available to give a picture of general speculative activities wholly dissociated from any particular group of stocks. But it is inappropriate for most other purposes for which averages are commonly used.

The Ratio Chart.—The ratio chart is designed to represent more accurately the comparative intensity of stock price movements. The usual method of plotting prices is based upon absolute changes in the averages. According to this method a decline of 10 in the average when this is low requires more space than a change of 10 when the level of prices is high. Yet when stock prices average, say, 50, a 10-point advance is in reality a 20 per cent change, while on a level of 200 a 10-point advance would be only a 5 per cent change. The ratio chart is designed to show percentage rather than point changes. This enables one to compare accurately the speculative movements of various periods of time with reference to their intensity.

Performance of Individual Stocks.—Doubts are sometimes raised concerning the agreement in movements of individual stocks during the course of major cycles. An examination was made of all common stocks listed on the New York Stock Exchange to discover the character of their movements in major swings between 1901 and 1923. It was discovered that in all but two bear markets (1901-1903 and 1909-1911) less than 10 per cent of the stocks moved against the trend and most of these for only a comparatively short distance. Selection would have been most difficult and the profits very limited. In every movement 10 per cent

of the stocks declined over 50 per cent in value, while in two cases the decline was approximately 70 per cent. In all cases 40 per cent of the stocks declined 25 per cent or more. In the bear market of 1906-1907, 84 per cent of the stocks declined 25 per cent or more.

In each of the eight major upswings between 1897 and 1926, 10 per cent of the stocks declined approximately 15 per cent or more. Ten per cent of the total number rose approximately 180 per cent or more, in one case (1897-1899) 10 per cent rose 300 per cent or more. In all cases 40 per cent of the number of stocks rose 50 per cent or more, in one case (1907-1909) 40 per cent rose 100 per cent or more.

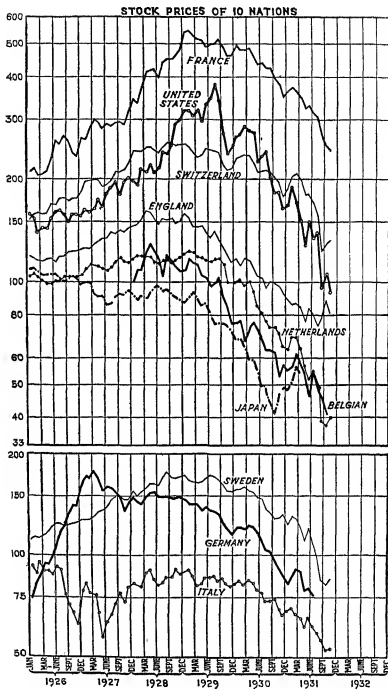
This investigation showed that it is more important to study general price movements than individual stocks. It was also discovered that in the more recent periods the tendency for all stocks to move with the downward trend was increased. Moreover, it was found that there is an increasing tendency for individual stocks to move downward while the general trend is upward.¹

The experience since 1926, particularly the decline since 1929, undoubtedly serves to emphasize these general conclusions. It may finally be remarked that the long-term investor in common stocks holds a very precarious position. The experiences of investment trusts with common stocks, on the theory of permanent investment are particularly disheartening.

International Stock Prices.—The financial markets of the leading nations of the world appear to be closely related to each other. Data are available for 10 leading countries as far back as 1926. At this time the Japanese and Italian stock markets were already declining. They were followed by German stock prices in March, 1927, England in April, 1928, Belgium in May, Switzerland and Sweden in September, 1928, Netherlands and France in February, 1929, and lastly the United States in August, 1929. At the present writing not one of these markets has definitely recovered.

Minor Cycles.—The course of prices in the stock market is never even. It has been compared to a stream whose general direction is plainly toward the sea, but which, in the course of its windings, often doubles back upon itself and for the moment flows in the opposite direction. Were the course of stock prices smooth, major movements would proceed uninterruptedly from the low point of the depression period to the high point of the period of prosperity. These movements, however, are often broken for a time during which prices move in the opposite direction. These interruptions in the major cycle are in reality but disguised minor cycles which have their own orbits and which develop regardless of the general level of prices both in the upward and downward major

¹ See article in *Barron's*, Feb. 7, 1927.

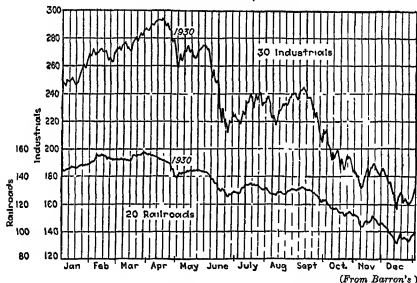


(From the Wall Street Journal.)

movements. They have their periods of advance and decline the same as the major cycles.

Minor cycles are of much shorter duration than major cycles; and the change in prices is much less in extent. For instance, in 1915 while the major trend of industrial stocks was upward, six well-defined minor cycles appeared during the year, during which prices ranged from less than 5 to more than 10 points. Again, early in the course of the bear market of 1920, a minor cycle developed with a range of 15 points. Occasionally a range of 20 or even 25 points is found in the minor cycle. The year 1930 furnishes a more recent illustration. During the first 4 months of this year when the trend of prices was upward, four distinct minor cycles developed. From June to September three additional ones

DOW-JONES AVERAGES, DAILY



are plainly visible. During the balance of the year, with the exception of November, the downward trend was too severe for minor cycles to emerge.

Just as in the case of major cycles railroad and industrial stocks move in harmony. The Dow-Jones averages for these two classes of stocks show that, in the 8-year period from 1915 to 1922 inclusive, every minor movement of the railroad averages, with only two unimportant exceptions, was accompanied by a similar movement in the industrial averages. During these 8 years there were 58 reactions among railroad stocks, and 56 among industrial stocks. The number during each year was remarkably regular, ranging in the case of railroad stocks from six to nine and in the case of industrial stocks from six to eight points. The similarity of movements may easily be observed throughout the year 1930. Exact synchronization of movements, however, is not possible.

The normal development of the minor cycle consists of a period of advance followed by a shorter period of decline. The decline, however, is less in extent than the advance but the new low point is measurably above the low point of the previous decline.

The minor cycle is the peculiar method by which stock prices are advanced and is primarily speculative in its nature. The advancing phase of the cycle is accomplished in anticipation of improvement in general conditions. But the tendency of speculation to go to excesses soon manifests itself and prices advance too rapidly. The result is that many buyers convert their paper profits into realized gains and for lack of sustained buying power prices are forced down. The decline may be accentuated by the operations of short sellers, who seek to take advantage of the overbought condition of the market. Should the market in turn become oversold, the short-covering movement is likely to give the initial advance in the succeeding minor cycle. Thus the minor cycle is the result of continual oscillations in prices during the course of an upward trend in the market.

Speculation and Stock Prices.—The subject of stock prices cannot be left without a special discussion of speculation. On this subject the most divergent opinions are entertained. The author will be content to brush aside controversy for the most part and present a simple statement of the matter as it appears to him.

Speculation is best treated under two heads: long buying and short selling. The influence of any factor on prices must be determined with reference to the different types of price movements, namely, the major trends, intermediate movements, and daily fluctuations. There is practically no disagreement as to the last. All writers have admitted without argument that speculation causes frequent daily oscillations in stock prices. Difference of opinion concerns the two other phases of prices.

First, consider major trends. One must be reminded at this point again that speculation looks to profit through change in prices and that dealing on margin is only one phase of speculation. All who buy and sell for profit are speculators. Speculation, therefore, embraces the entire buying movement, except investment buying, that develops during the course of a major upward trend in prices. Nevertheless, margin buying, buying on borrowed money for profit, both in the case of brokers' loans and direct borrowing from banks, constitutes the main phase of speculation. The extent of speculation, then, may be roughly measured by brokers' loans and other collateral loans at banks. For an illustration may be taken the most recent bull movement in stocks, the period 1924-1929. Comparable loan data for this period began in 1926. The minimum known securities loans as published by the *Wall Street Journal* are the total of loans by Federal Reserve member banks in 101 cities, loans

to brokers for account of "others," and brokers' loans from "others" besides banks. None of these figures overlaps. The figures for security loans at the end of September of each year since 1926 are as follows:

TABLE 84—MINIMUM KNOWN SECURITIES LOANS, SEPTEMBER 30 OF EACH YEAR
(000,000 omitted)

Year	Securities loans (report- ing member banks)	Loans for "others" ¹	Loans from "others." ²	Total	Brokers' loans ²
1926	\$5,884	\$ 474	\$ 691	\$ 7,049	\$3,218
1927	6,457	918	575	7,950	3,914
1928	6,865	1,958	866	9,689	5,513
1929	7,826	3,907	1,472	13,205	8,549
1930	8,488	627	425	9,535	3,481
1931	6,346	137	112	6,595	1,044
1932 (May 31)	4,907	6	57	4,970	800

From *Wall Street Journal*

¹ Federal Reserve Bank brokers' loan figures

² New York Stock Exchange loan figures

There can be no question but that this array of figures shows the ebb tide and flow of speculation on the long side for profits. The figures for total brokers' loans in the last column show the frenzy of margin speculation from 1926 to 1929 when they rose 166 per cent, they show also the unparalleled ebb of the tide in the short period that followed. This period of speculation coincides with the rise and fall of security prices and with the reversal of the trend in 1929. Scarcely anyone would have the boldness to argue that long speculation was not mostly responsible for the exaggerated bull market of this period. This conclusion is supported also by the exaggerated relation of the price-earnings ratio previously noticed.

Pursuing the same method of analysis, variation in brokers' loans is easily correlated with the intermediate movements in stock prices. For instance, in the intermediate upswing in the latter half of 1928, brokers' loans increased from \$4,837,000,000 on July 31 to \$6,439,000,000 on December 31. This was followed by practically stationary figures until the next intermediate upswing occurred in the third quarter of 1929, when loans moved up to \$8,549,000,000 by September 30, after this the decrease with the panic reduced them to \$3,989,000,000 by December 31.

The conclusion, then, with respect to long speculation is that it is the most dominant force in major and intermediate, or minor, trends in stock prices. The distortion in the price-earnings ratio is strong evidence that investment buying was of minor importance in the major trend. Since minor upward trends in prices are always followed by

relapses, the evidence again seems to indicate the relative unimportance of investment buying.

Short Selling and Stock Prices —Short selling differs from long buying in that it is comparatively restricted in amount. While the public indulges in short selling to some extent, this practice is indulged in mostly by the professional elements in the stock market. Undoubtedly the greater portion of the selling on major declines comes from the long accounts of the general public. This is strongly indicated by the rapid decline in brokers' loans from 1929 to 1932. The problem, then, is as to the influence of a restricted amount of short selling on stock prices.

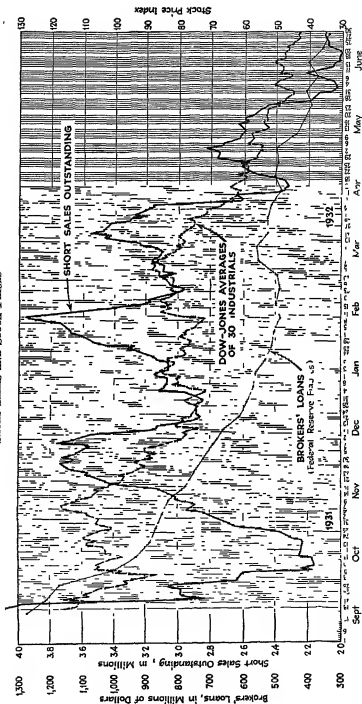
Beginning with the major downward trend, it is frequently argued that since short selling is followed by short covering in equal amount, the activities of short sellers can have no influence on prices. Unfortunately there are no adequate statistics on short accounts to argue this point conclusively one way or the other, since figures for the short account were published for the first time in 1931. Any position taken, therefore, must be based upon limited evidence.

Here it may be recalled that the forces of liquidation in security markets, as well as in other markets, gather force as prices decline and confidence wanes. Furthermore, necessitous selling is made more necessitous as declining prices endanger long positions which have been built up in the previous period of advance. It may, then, be taken for granted that whatever tends to depress prices or restrain them from recovering also forces additional liquidation and a still further decline in prices. The question of whether short selling depresses prices in the major trend may be restated in terms of whether it induces further liquidation or selling of long accounts during the course of the downward trend. This problem may best be viewed in the light of the intermediate movements.

The accompanying chart throws much light on the question of short selling. Beginning in October, 1931, a mild upward trend developed and this was accompanied by an increasing short position. The market turned down at the beginning of November as the short interest strengthened. Not until the second week of December did the short interest cover its position to any extent. When the short interest was at its peak, prices were not only considerably below their high of early November but they were also lower than their previous low, which shows a continuation of the major trend downward. When the decline in stocks began in early November, the volume of transactions rose rapidly and brokers' loans decreased accordingly. The conclusion seems to be plain that the increase in short selling finally thwarted the efforts of the market to recover during October.

In the first 6 months of 1932, this same phenomenon was repeated three times, as may easily be observed from the chart. In each case the

SHORT SALES AND STOCK PRICES



(Short sales from New York Stock Exchange Bulletins)

trend of the short position moved in the opposite direction from stock prices. Each time the efforts of the market to rise were defeated by increasing short interest. There is reason to believe that these ill-starred efforts at recovery were due largely to investment buying, since brokers' loans give little evidence of margin or speculative buying.

From the evidence presented, it seems that there are strong grounds to believe that short selling indirectly prolongs the major downward trends in stock prices, and that it is easily the most important factor in the intermediate swings.

But short selling does not always depress prices, or, rather, the covering movement acts in the opposite direction. Initial advances after several months of sinking prices covering the 9 months preceding July, 1932, were always accompanied by reduction in the short interest, it seems fair to conclude that this process lifts prices for a short while at least. Furthermore, it may readily be admitted that at critical junctures, when liquidation is heavy and prices are collapsing, the short interest through its covering movement actually supports the market. This was admirably demonstrated on September 21 to 23, the three days following the announcement of suspension of gold payments in England. On this occasion the Governing Committee of the Exchange suspended short selling, hoping that the covering movement would develop and support prices. The experiment was a success. In the three days concerned, the short interest reduced its position by 1,410,172 shares.¹ In these three days the Dow-Jones industrial averages rose from 110.83 to 115.99.

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INDEX

A

Accounting and management, 232-233
Accretion, gains from, 11
Accrued depreciation, basis of computing, 366-367
 a cost of service, 364-365
 in public utilities, 366-367
 Supreme Court on, 367-368
 theory of, 363-364
 and valuation, 362-363
Adjustment bonds, 182
Agricultural depression, causes of, 604
Agriculture and business cycles, 714-715
Airways and railways, 275
America, a creditor nation, 672-675
American state bonds, 629-648
 certification of, 646
 contractual features of, 642-643
 serial issues, 645-646
 sinking funds, 645
 taxation of, 647-648
American states, expenditures of, 641-642
 revenue systems of, 640-641
 sovereignty of, 643-644
 wealth of, 639-640
American Telephone and Telegraph Company, contracts of, with Western Electric Company, 482
 early financing by, 480
 organized, 479
 recent progress of, 483
 responsibility assumed by, 480-482
American Water Works Association, 431, 433-435
Appreciation, gains from, 11
Arkansas, debt of, 633
Asset element of credit, 158-176
 importance of, 158-160
 versus income element, 136-137
Asset values, 161-162
 of luxuries, 164-165
 of necessities, 164-165

Assets, cash, 168-169
 current, 168
 as basis of credit, 171
 fixed, 166-167
 intangible, 172-173
 inventory, 169-171
 investment, 171-172
 in liquidation, 161
 margin of safety in, 173-175
 nature of, as security, 160-161
 non-specialized, 164
 price of, in business cycles, 165-166
 changes in, 162-164
 ratio of, to capitalization, 176
 specialized, 164
 wasting, 167-168
Assumed bonds, 195
 of railroads, 338
Automobile insurance, 550
Automotive competition with railways, 273-274

B

Balance of international payments, 680-681
Baltimore and Ohio Railroad, 266-267
Bank credit and security prices, 693-694
Bank failures, 527
 causes of, 527-529
 management and, 529-531
 supervision and, 531-532
Bank rate of interest and bond prices, 695
Bank stocks, 522-540
 assessment of, 538
 double liability of, 538
 legal position of, 537
 in New York City, 538-539
 ownership of, 539-540
 in Chicago, 540
 prices of, 539
Banking, ancient, 522-523
 branch, in the United States, 532-533
 and business cycles, 714
 early, 522-523

- Banking, in England, 524
 - free, 526
 - Lombard, 523
 - mediaeval, 523-524
 - modern, 524-525
 - in the United States, 525-527
 - "wildcat," 525-526
- Banks, commercial, assets of, 535-536
 - consolidation of, 532
 - efficiency of operations of, 535
 - expenses of, 534
 - financial results of, 538-539
 - investments of, 49-50
 - liabilities of, 536-537
 - national, earnings of, 84
 - net earnings of, 535
 - reserves of, 534-535
 - revenues of, 533-534
 - savings, investments of, 51
- Bell Telephone System, assets of, 491
 - bonds of, 492
 - capitalization of, 491-492
 - common stock of, 493-494
 - competition of other companies with, 480-481
 - debenture bonds of, 492
 - depreciation charges of, 490
 - gross revenues of, 488-489
 - cyclical influences on, 489-490
 - mortgage bonds of, 492-493
 - net income of, 490-491
 - operating expenses of, 490
 - operating ratio of, 490
 - period of competition, 480
 - period of monopoly, 478
 - policy of, 477
 - preferred stocks of, 493
 - statistics of, 488
- Blanket-mortgage bonds of railroads, 337
- Board of directors, 201-202
 - duties of, 202
- Bond house, international, 34-35
 - rise of, 33-34
- Bond prices, 722-733
 - and bank rate of interest, 695
 - cataclysm of, of 1931, 733
 - and commodity prices, 701-702
 - cycles of, since 1920, 732-733
 - forecasting, 731-732
 - major cycles in, 730-731
- Bond prices, movements of, 723
 - from 1875 to 1899, 724-725
 - from 1899 to 1920, 727-729
 - since 1920, 729-730
 - secular, 723-724
 - of United States, 725-726
 - in World War period, 732
 - and stock prices, 745-746
- Bond yields, and amortization, 115-116
 - and interest interval, 115
 - and interest rate, 103-104
 - interpolation, 115
 - sample table of, 114
- Bonds, adjustment, 182
 - assumed, 195
 - of railroads, 338
 - blanket mortgage, of railroads, 337
 - collateral trust, 192-193
 - coupon, 188
 - debenture, 194-195
 - equipment, 193-194
 - guaranteed, 195-196
 - income, 182
 - joint, 196
 - market quotations of, 116-117
 - preference, 182
 - quoted "flat," 116
 - registered, 188
 - versus stocks, 180-181
- Branch banking in the United States, 532-533
- Bubble Act, 23
- Building and loan association, assets of, 52
- Business, failures, 84
 - financial result of, 77-84
 - and profits, 711
- Business cycles, and agriculture, 714-715
 - amplitudes of, 718-719
 - and banking, 714
 - and changes in capital values, 712
 - and changes in volume of business, 714
 - and commodity-price changes, 165-166, 711-712
 - defined, 706
 - and demand and supply, 713
 - duration of, 717
 - experience, 719-721
 - forecasting of, 719
 - in history, 706-707
 - international, 716-717
 - and price margins, 712-713

- Business cycles, prosperity and depression phases of, 717-718
 - and railroad traffic, 319-320
 - and speculation, 713
 - statistics and, 710-711
 - theories of, 707-710
 - contribution of, 710
 - and time element, 713-714
 - and wages, 715
- Business fluctuations, 703-721
- Business forecasting, 719
 - types of, 704
- Business risk, 128-129
- C
- California, debts of, 634-637
- Canal, 264-265
 - versus railroads, 268
- Capital, annual demand for, 65-67
 - consumers' goods as, 6
 - development of, in the United States, 43-44
 - fixed, immobility of, 87
 - function of, 72-73
 - immobility of, 87
 - invested, return to, 77-91
 - reward for, 75
 - statistics of accumulation of, 44-46, 63-64
 - ultimate demand for, 73-74
 - and wages, 74
 - (See also Investment funds)
- Capital market and stock prices, 738-739
- Capitalization, in electric light and power industry, 397-398
 - of electric railways, 453-454
 - in gas industry, 418
 - relation of, to assets, 176
 - of telegraph companies, 471-472
 - of water works, 435-436
- Carey Act bonds, 667
- Cash, importance of, 168-169
 - ratio of, to current obligations, 176
- Caveat emptor, 239
- Certificates of public convenience, 352
- Certification of state bonds, 646
- Cities, location of, 572
- Clayton Act of 1914, 292-293
- Collateral trust bonds, 192-193
 - of railroads, 339-340
- Commercial banks, investments of, 49-50
- Commodity prices, and bond prices, 701-702
- Commodity prices, and business cycles, 165-166, 712
 - changes in, 162-164
 - and interest rates, 698-701
 - and investment risk, 123-124
- Common stocks, class A, 219-220
 - dividends on, 183
 - as investments, 566-567
 - market for, 734
 - in reorganization, 220
 - value of, 735-736
 - widespread interest in, 734
 - (See also Stock prices)
- Communication by signal, 456
- Competition, among industrial companies, 497-498
 - and profits, 88
- Competitive cost the true principle in valuation, 360-361
- Consolidation of railroads, 300-301
- Construction company, 327-328
- Consumers' goods as capital, 6
- Consumption loans, income element of credit in, 137-138
 - in the United States, 68-70
- Contract (see Investment contract)
- Contractual element of credit, bonds and notes, 178-200
 - stocks, 201-220
- Control, contractual features of, 184
- Convertible bonds, of railroads, 339
- Cooke, J., 33-34
- Corporations, Smith, A., on, 28
 - in the United States, 24-25
 - charters granted to, in eighteenth century, 25
 - deficits of, 78-81
 - features of, 25-26
 - income of, 78-84
 - risk and income in, 27-28
 - separation of ownership and management in, 26-27
 - stockholders in, position of, 26-27
 - weakness of form of organization, 28
- Coupon bonds, 188
- Credit, and Federal Reserve banks, 697-698
 - and gold, 695-697
 - (See also Investment credit)
- Credit insurance, 550
- Credit risk, 128-129
- Current assets, 168
 - as basis of credit, 171

Current ratio, 175-176
 Cycles, major, in bond prices, 730-731
 (*See also* Business cycles)

D

Debenture bonds, 194-195
 of electric light and power companies, 399
 of railroads, 338
 of telephone companies, 492
 Debt, federal, 65-67
 national, burden of, 620-621
 state and municipal, 67
 Deed of trust, 185-186
 Default, on corporation mortgages, 188-189
 Deficits, of corporations, 78-81
 according to size, 81
 Demand and supply, and business cycles, 713
 and interest rate, 97-98
 Depreciation, in railroads, 296-297
 policy of corporations, 232
 policy of industrial concerns, 508, 510-511
 in water works, 432-433
 (*See also* Accrued depreciation)
 Depression and prosperity, 717-718
 Diminishing returns, law of, 42
 and profits, 85
 Direct expenses, 144-145
 Directors, board of, 201-202
 duties of, 202
 Discounting process in stock prices, 738
 Diversification in investments, 567-568
 Dividend policy, and good faith, 234-236
 of Pennsylvania Railroad, 234
 of United States Steel Corporation, 234
 Dividends, contractual features of, 183-184, 205-206
 and stock prices, 731-737
 Double liability of bank stocks, 538
 Dow, Charles H., theory of stock price movements, 746-748
 Drainage bonds, 669
 Dynamic economic forces, 703-704
 Dynamic industry and profits, 90
 Dynamo, invention of, 377

E

Earnings, and stock prices, 736-737
 (*See also* Income)
 Eastern trunk-line consolidations, 301

Economic equilibrium, 710
 Economic reserve, 5-6
 Edison stations, 378-380
 Electric light, development of, 376-378
 Electric light and power, 375-402
 assets of, 394
 business cycles and, 392-394
 capitalization of, 397-398
 common stocks in, 400
 corporate organization of, 394-395
 debenture bonds and notes in, 399
 first and refunding mortgages in, 398-399
 groups of companies in, 395-396
 holding company in, 396
 investment company in, 396-397
 management company in, 396
 market for securities of, 400-401
 mortgage bonds in, 398
 operating expenses of, 391-392
 operating ratio in, 392
 operating revenues of, 389-390
 outlook for industry, 384-385
 preferred stocks in, 399-400
 taxes on, 392
 Electric motor, invention of, 378
 Electric power, development of, 378-380
 Electric railways, accounting in, 449
 automotive competition with, 444-446
 bonds of, 454
 business cycles and, 451-452
 capitalization of, 453-454
 early, 438-440
 fares of, 443-444
 finances of, 452-453
 franchises of, 447
 modern development of, 440-441
 notes of, 454
 operating expenses of, 449-450
 operating income of, 451
 operating ratio of, 450-451
 operating revenues of, 449
 cyclical fluctuations in, 451-452
 seasonal variations in, 451
 other difficulties, 446-447
 post-war period of, 442
 receiverships of, 443
 recent progress of, 447-448
 securities of, in receivership, 453
 taxes on, 450
 traffic density of, 448-449

- Electric railways, and the World War, 441-442
- Electric transmission, development of, '378
- Electrical industry, growth of, 380-381
interconnection in, 388-389
and railroads, 387-388
in rural districts, 385-386
farm load, 386
farm rates, 386-387
financing of, 386
- Electricity, new uses for, 388
realm of, 375-376
technical development of, 376
- Elkins Act of 1903, 288
- Emery, H. C., on investment, 12
on speculation, 12
- Equipment obligations, 193-194
of railroads, 340-341
- Erie canal, 264-265
- Esch-Cummins Act of 1920, 297-302
(See also Transportation Act of 1920)
- Exchanges, foreign, 680-681
- Expenditures, of states, 641-642
of United States Government, 625-626
- Expenses, direct, 144-145
- F**
- Factor of safety, cumulative, 153-154
in income, 152-156
non-cumulative, 153-154
size, question of, 154-156
- Failure, of banks, 527-532
business, 84
- Farm accounting, 592-594
- Farm lands, accessibility of, 590-591
income from, 589-590
location of, 590-591
speculation in, 596
taxation of, 603-604
valuation of, 594-597
- Farm management, 591
- Farm-mortgage business, development of, in the United States, 588-589
- Farm-mortgage indebtedness, 602-603
in Nebraska, 603
- Farm mortgages, 588-605
market for, 604-605
- Farm products, prices of, 591-592
- Farm property, taxation of, 603-604
value of, 594-597
- Federal Farm Loan System, 597-598
loans under, 597-598
- Federal Land Bank bonds, 599-600
- Federal Land Banks, 598-599
- Federal Reserve Banks and credit, 697-698
- Federal Water Service, 431, 433-437
- Finance and investment, 18-19
- Finance company, 563
- Financial ratios, 175
- Financial results of business, 77-84
- Financial risk, 129-130
- Fire insurance, in England, 543-544
in the United States, 546-547
- Fitch rating system, 252-253
symbols, 252-253
- Fixed assets, 166-167
- Fixed capital, immobility of, 87
- Fixed trust, 562-563
- Floating supply of securities, 690
- Florida, debt of, 633
- Forecasting bond prices, 731-732
- Forecasting business, 719
- Forecasting stock prices, 744-745
- Foreign countries, budgets of, 679-680
statistics of debts of, 678
- Foreign exchanges, 680-681
- Foreign indebtedness to United States Government, 615
- Foreign investments of the United States, 672-686
contractual features of, 682-683
defaults on, 676-677
market for, 684
and pledged revenues, 683-684
prices of, 684-686
purposes of, 675-676
sinking funds and, 683
statistics of, 68, 673-675
yield on, 684-686
- Franchises of public utilities, 349-350
service-at-cost, 355-356
sliding-scale, 354-355
of street railways, 447
- Freight-car performance, 315-316
- Freight-train performance, 316
- G**
- Gambling, Chamberlain, L., on, 17n.
Emery, H. C., on, 17n.

Gambling, Pratt, S S, on, 16
 Price, T, on, 16
 speculation distinguished from, 15-17
 Gas, domestic use of, 412-414
 in industry, 414
 Gas industry, 403-422
 assets of companies in, 417
 bonds in, 418-419
 by-products of, 407
 capitalization in, 418
 competition in, from without, 405-406
 early beginnings of, in England, 403-404
 holding company securities in, 420-422
 manufactured gas in, 407-408
 natural gas in, development of, 410-411
 problems created by use of, 412
 in the United States, 409
 utilization of, 409-410
 net income in, 417
 operating expenses in, 416
 operating ratio in, 417
 operating revenues in, 415-416
 pipe lines in, in the United States, 410-411
 recent progress in, 408-409
 taxes in, 416-417
 technical improvements in, 406-407
 in the United States, 404-406
 Gas research, 415
 Georgia, debt of, 636
 Glass-Steagall law, 682
 Gold, as basis of monetary system, 53
 54
 and credit, 695-697
 Good faith, and accounting, 232-233
 and dividend policy, 234-236
 in government contracts, 231
 in keeping the contract, 231-232
 of management, 239-240
 and manipulation, 236
 and overcapitalization, 233-234
 in publicity, 237-239
 and pyramiding, 237-239
 recognition of, as element of credit, 229-230
 in reorganization, 232
 Government loans and income element
 of credit, 138-139
 Granger laws, 283-284

Great cycles in stock prices, 741-742
 Guaranteed bonds, 195-196
 of railroads, 338
 Guaranteed mortgages, 585

H

Hamilton, Alexander, 609-610
 Hepburn Act of 1906, 288-291
 rates and fares under, 290
 Hoch-Smith Resolution, 303-304
 Holding companies, in electric light and
 power, 396-397
 income of, 149-150
 Holding-company securities, in gas in-
 dustry, 420-422
 of water works, 436-437
 Home rule, 353-354
 Hydro-electric power, development of,
 381-382
 economics of, 382-383
 function of, 383-384
 future of, 384

I

"Ideal investment," 242-243
 Illinois, debt of, 632
 Income, analysis of, 141-142
 as basis of credit, 139-140
 contingent, in contract, 182-183
 corporate, 78-84
 distribution of, 48
 according to size, 78-84
 distribution of, by function, 48
 fixed, in contract, 181-182
 future versus present, 156
 future, present value of, 108-109
 gross operating, 143
 and price changes, 143-144
 and volume of business, 144
 of holding companies, 149-150
 importance of, overestimated, 159-160
 individual, sources of, 47
 national, 46-49
 net, 148
 to investment, 151-152
 other, 147
 participating, in contract, 183
 permanence of, and credit, 140-141
 quality of, and credit, 141
 realized, amount of, 47
 sinking funds and, 148-149

- Income, stability of, and credit, 140
 - total, 147-148
- Income bonds, 182
- Income element of credit, 136-156
 - versus asset element, 136-137
 - consumption loans and, 137-138
 - and government loans, 138-139
 - of railroads, 339
- Income ratios, 150
- Income statement, 142
- Indeterminate permit, 351-352
- Indiana, debt of, 632
- Industrial companies, accounts receivable
 - in, 513
 - assets of, 511
 - bonds of, 514-516
 - record of, 516-517
 - capitalization of, 514
 - cash account of, 513
 - classification of, 499-500
 - common stocks of, 519-520
 - competition of, 497-498
 - current liabilities of, 513-514
 - current ratio in, 511-512
 - depreciation policy of, 508, 510-511
 - earnings on invested capital of, 507-508
 - income of, 504-505
 - business cycles and, 508-510
 - importance of trend in, 505-506
 - inventory of, 512-513
 - in manufacturing, 501-502
 - margin of profit in, 506-507
 - obsolescence of products in, 499
 - preferred stocks of, 517-519
 - prices of, 518-519
 - producing raw materials, 499-500
 - serving consumers, 502-503
 - serving producers and consumers, 503-504
 - substitution of products in, 498-499
 - trading companies, 504
- Industrial securities, 496-521
 - market for, 520-521
 - in receivership, 498
 - rise of, 496-497
- Inland Waterways Corporation, 274
- Insurance, and Armstrong investigation, 549
 - automobile, 550
 - credit, 550
 - fire, in England, 543-544
 - in the United States, 544-547
- Insurance, life, in England, 547
 - in the United States, 548-549
 - present status of, 549-550
- marine, early, 541-542
 - in the United States, 542-543
- surety and fidelity, 550
- Insurance companies, assets of, 554-558
 - finances of, 550-558
 - and investment funds, 51
 - investments of, 51-52, 553-555, 557
 - loading for expenses and taxes of, 551-552
 - underwriting profit and loss of, 552-553
- Insurance stocks, 541-558
 - prices of, 558
- Intangible assets, 172-173
- Interest, 94-104
 - exchange theory of, 96-97
 - explicit, 94
 - gross, 95
 - implicit, 94
 - investment significance of, 106-107
 - net, 95
 - productivity theory of, 96
 - and profits, 92-107
 - pure, 95-96
 - risk, 95-96
 - theories of, 96-97
- Interest interval and bond yields, 115
- Interest rate, bond yields and, 103-104
 - and commodity prices, 698-701
 - demand and supply and, 97-101
 - equilibrium theory of, 97
 - in history, 722-723
 - market, 102-103
 - money, supply of, and, 101-102
 - the price of capital funds, 98
 - and stock prices, 736
 - supply and demand and, 97-98
- International bond house, 34-35
 - rise of, 33-34
- International business cycles, 716-717
- International credit, breakdown of, in 1931, 681-682
- International payments, balance of, 680-681
- International Telephone and Telegraph Company, 468-469
- Interpolation in bond yields, 115
- Interstate Commerce Act of 1887, 286-287

- Interstate Commerce Act of 1887, present status of, 292-293
- Inventory, 169-171
- Invested capital, return to, 77-91
- Investment, defined, 3-19
 - Emery, H. C., on, 12
 - and finance, 18-19
 - for income, 9-11
 - individual, 7-8
 - Inglis, R. H., on, 7*n*.
 - losses, 11
 - modern, 4-5, 20-41
 - motives in, 89
 - origin of, 3-4
 - Pratt, S. S., on, 12-13*n*.
 - processes, 4
 - profits, 11
 - safe, 133-134
 - a science, 3
 - scope of, 8
 - secured, 121
 - speculation distinguished from, 12-14
 - unsecured, 121
 - usage of term, 6-7
- Investment banker, management functions of, 223-224
- Investment banking, 32
 - evolution of, 32-33
- Investment contract, evolution of, 178-180
 - nature of, 180
 - in reorganization, 191-192
- Investment credit, asset element of, 158-176
 - contractual element of, bonds and notes, 178-200
 - stocks, 201-220
 - elements of, 134-135
 - income element of, 136-156
 - management element of, 222-240
 - personal element in, 222-223
- Investment fund trust, 562
- Investment funds, annual demand for, 65-87
 - demand for, 61-76
 - consumption demand for, 68-70
 - theory of, 71-72
 - evolution of demand for, 62-63
 - federal debt and demand for, 65-67
 - foreign investments and demand for, 68
 - funding operations and demand for, 71
- Investment funds, annual demand for, sources of demand for, 61-62
- speculative demand for, 70-71
- state and municipal debt, and demand for, 67
- supply of, 42-59
 - building and loan associations and, 52
 - commercial banks and, 49-51
 - distribution and, 55
 - Federal Farm Loan System and, 52
 - insurance companies and, 51
 - international stability and, 54
 - production and, 54-55
 - savings banks and, 51-52
 - sound currency and, 52-54
- Investment market, changes in, 726-727
- Investment risk, 121-135
 - commodity prices and, 123-124
 - credit risk in, 128-129
 - financial risk in, 129-130
 - market risk in, 130-131
 - politics and, 132-133
 - principal and income, importance of, in, 126-128
 - time element in, 124-126
 - unpredictable risks in, 131-133
- Investment trusts, 559-570
 - abuses of, 564
 - accounting methods of, 563-564
 - American, 561
 - experience of, 563
 - British experience with, 559-561
 - capitalization of, 568-569
 - early, 559
 - finance company, 563
 - financial policy of, 564-566
 - fixed trust, 562
 - management type of, 561-562
 - in New York, 564
 - portfolios of, 565-566
 - securities of, prices of, 569-570
 - stocks of, 569
 - market for, 570
 - types of, 561
- Investments, American, in 1854, 30
 - as basis of credit, 171-172
 - foreign, of the United States, 68
 - issues, 1920-1929, 31
- Investors versus managers, 76
 - speculative, 14
- Irrigation bonds, 666-669

J

- Joint bonds, 196
- Joint-stock company, in England, 22-24
- Joint Stock Land Bank bonds, 600-601
- Joint Stock Land Bank stocks, 601-602
- Joint Stock Land Banks, 600

L

- Land trust certificates, 585-586
- Land valuation, in public utility regulation, 361-362
- Levee bonds, 669
- Liberty bonds, market for, 628
 - prices of, 626-627
 - provisions of, 617-618
 - yield on, 628
- Life insurance, in England, 547
 - in the United States, 548-549
 - present status of, 549-550
- Locomotive performance, 316
- London Stock Exchange, evolution of, 35-37
- Losses, from decretion, 11
 - from depreciation, 11
- Lost certificates, 210
- Louisiana, debt of, 636

M

- Maintenance of property, 226-227
- Major cycles, phases of, 741
 - in stock prices, 740-741
- Management, changing attitude of, 228-229
 - character of basic importance in, 230-231
 - devotion of, to task, 226
 - good faith of, 224-226
 - maintenance of property by, 226-227
 - and profits, 86
 - progressive, 227-228
 - relation of, to labor and personnel, 227
 - specialization of, 223
 - as trustee, 239-240
 - two aspects of, 224
- Management element of credit, 222-240
- Management trust, 561-562
- Manipulation, and good faith, 236

- Mann-Elkins Act of 1910, 291-292
- Manufactured gas, 407-408
- Margin of safety, in assets, 173-175
 - in income, 152
- Marine insurance, early, 541-542
 - in the United States, 542-543
- Market risk, 130-131
- Marketability and interest rate, 93-94
- Maryland, debt of, 632
- Michigan, debt of, 633
- Milwaukee agreement, 356-357
- Minnesota, debt of, 634
- Minor cycles in stock prices, 749-751
- Mississippi, debt of, 633
- Missouri, debt of, 636
- Modern investment, 20-41
 - evolution of, 21, 28-31
 - intangible character of, 20-21
 - public debts and, 28-29
- Money market and stock prices, 638-639
- Monopoly and profits, 89
- Moody's rating system, 244-250
 - estimate of, 249-250
 - stocks in, 248-249
 - symbols of, 248
- Moratorium of 1931, 614
- Morse's telegraph, 453-459
- Mortgage, blanket, 190
 - closed, 189-190
 - corporation, 185-188
 - default on, 188-189
 - defined, 185-186
 - junior, 190-191
 - open, 189-190
 - real estate, 571
 - specific, 190
 - tax covenant in, 187-188
 - trustee of, 186-187
- Mortgage bonds, collateral, in real estate, 585
 - in electric light and power industry, 398-399
 - in gas industry, 419
 - of railroads, 336
 - in real estate, 585
 - of telephone companies, 492-493
- Motor truck and railroads, 273-274
- Municipal bonds, 649-671
 - invalidity of, 661-662
 - legality of, 659-660

Municipal bonds, meaning of term, 649
 prices of, 670
 remedy in default on, 664
 serial issues of, 665-666
 sinking funds of, 664-665
 validation of, 662-663
 for water works, 429-430
 Municipal corporations, borrowing power of, 657-659
 power of taxation of, 656-657
 powers of, 655-656
 Municipal debts, burden of, 654-655
 causes of increase in, 651-652
 defaults on, 652-654
 history of, 649-650
 limitations on, 660-661
 present status of, 650-651
 purpose of, 651
 recent defaults on, 653-654
 Municipal warrants, 663

N

National banks, earnings of, 84
 National debts, burden of, 620-621
 National income, 692
 National savings, 692
 Natural gas in the United States, 409
 development of, 410-411
 problems created by, 412
 utilization of, 409-410
 Net income to investment, 151-152
 New York Curb, 40
 New York Stock Exchange, closing of, in 1914, 691
 economic functions of, 40-41
 evolution of, 37-39
 listings on, 39, 40
 Nominal return, 111-112
 Non-specialized assets, 164
 North Carolina, debt of, 636
 North Dakota, debt of, 638
 Notes, railroad, 338

O

Ocean cables, 465-467
 of Commercial Cable Company, 468-469
 of Western Union, 467-468
 O'Fallon decision, 304-305
 results of, 305
 Operating ratio, 150-151

Other income, 147
 Overcapitalization, 233-234

P

Panama Canal and railroads, 274-275
 Panama Canal Act of 1912, 292
 Panic of 1893, effect on railroads, 331
 Pennsylvania, debt of, 632
 Pipe lines and railroads, 275
 Pledged revenues, 683-684
 Poor's rating system, 250-252
 symbols of, 250-251
 Preference bonds, 182
 Preferred stocks, as to assets, 214-215
 classified, 212-213
 cumulative dividends on, 213-214
 in electric light and power industry, 399-400
 in gas industry, 420
 of industrial companies, 517-519
 prices of, 518-519
 non-cumulative dividends on, 213-214
 protective features of, 215-218
 examples of, 218-219
 relating to assets, 217-218
 relating to earnings, 218
 relating to liens, 216-217
 of railroads, 341
 in reorganization, 220
 of telephone companies, 493
 of water works, 437
 Price, value, and yield, 108-117
 Price changes and business cycles, 711-712
 Price-earnings ratio in stock prices, 739-740
 Price level, changes in, and profits, 89-90
 Price margins and business cycles, 712-713
 Profit, theories of, 104-105
 Profits, from accretion, 11
 from appreciation, 11
 and business, 711
 and competition, 88
 and dynamic industry, 90
 elements in, 105-106
 gross, 145-146
 and interest, 92-107
 investment, 11
 significance of, 106-107

- Profits, and management, 86
 - and monopoly, 89
 - net, 146-147
 - speculation, 107
 - Proportional costs, law of, 74-75
 - Prosperity and depression, 717-718
 - Public Credit Act of 1869, 613
 - Public utilities, appraisal of, 358
 - franchises of, 349-350
 - legal classification of, 345-346
 - meaning of term, 345
 - Public utility commissions, 351
 - advantages of, 352-353
 - legal status of, 353
 - Public utility regulation, 345-373
 - accrued depreciation in, 362-364
 - theory of, in, 363-364
 - appraisal of property in, 358
 - certificate of public convenience in, 352
 - by commission, 351
 - advantages of, 352-353
 - competitive cost in, the true principle, 360-361
 - dilemma of, 357
 - by franchise, 350-351
 - home rule in, 353-354
 - indeterminate permit in, 351-352
 - land valuation in, 361-362
 - legal doctrine of valuation in, 357-358
 - local, 348-349
 - Milwaukee agreement, 356-357
 - rate of return allowed in, 368-371
 - and actual cost of capital, 371-372
 - recent trends of, 369-371
 - service-at-cost franchises in, 355-356
 - sliding-scale franchises in, 354-355
 - stages in, 346-348
 - valuation standards in, 358-360
 - working capital in, 362
 - Puberty, corporate practice in, 238
 - and good faith, 237-239
 - Pyramiding and good faith, 237
- R
- Railroad charters, early, 281
 - Railroad commissions, early, 283-284
 - Railroad consolidations, 271-272
 - and overcapitalization, 331-333
 - Railroad credit, 306-307
 - Railroad failures, causes of, 335
 - Railroad plant situation, 313-314
 - Railroad rates, development of, 270-271
 - discrimination in, early, 282-283
 - under Hoch-Smith Resolution, 303-304
 - reasonable, 293-294
 - Railroad regulation, 277-307
 - background of, 282-283
 - by charter, 281
 - by competition, 283
 - constitutional power in, 284-285
 - federal versus state authority in, 285-286
 - Granger laws and, 283-284
 - judicial review in, 288
 - rate of return under, 305-306
 - by statute, 281-282
 - Railroad securities, 326-343
 - assumed bonds, 338
 - blanket-mortgage bonds, 337-338
 - bonds, overissue of, 329-334
 - versus stocks, 333
 - collateral trust bonds, 339-340
 - common stocks, 341-342
 - convertible bonds, 339
 - debenture bonds, 338
 - equipment obligations, 340-341
 - guaranteed bonds, 338
 - income bonds, 339
 - in leading systems, 334
 - margin of safety of, 336
 - market for, 343
 - mortgage bonds, 336
 - notes, 338
 - preferred stocks, 341
 - stocks versus bonds, 333
 - in leading systems, 334
 - Railroad traffic, analysis of, 309-311
 - average haul of, 312
 - cyclical fluctuations in, 319-320
 - density of, 312-313
 - in leading systems, 313
 - origin of, 311
 - passenger, 311
 - permanence of, 311-312
 - present status of, 275-276
 - seasonal variations in, 319
 - of selected systems, 310-311
 - Railroad valuation, 297
 - and O'Fallon case, 305

- Railroads, and air transportation, 275
 - in America, early, 266-268
 - equipment of, 270
 - and automotive competition, 273-274
 - versus canals, 268
 - causes of failure of, 335
 - depreciation in, 296-297
 - economics of, 259-276
 - electrification of, 387-388
 - employment in, 317
 - in England, early, 265-266
 - equipment of, 315
 - equipment utilization of, 317
 - extra track of, 314
 - financial analysis of, 309-325
 - financial history of, 326-335
 - freight-car performance of, 315-316
 - freight-train performance of, 316
 - fuel consumption of, 316-317
 - government aid to, 269-270
 - grades and curves of, 314-315
 - income of, 317
 - and Inland Waterways Corporation, 274
 - labor problem of, 301-302
 - locomotive performance of, 316
 - net operating income of, 323
 - new capital investments of, 324-325
 - non-operating revenues of, 318
 - operating efficiency of, 315
 - operating expenses of, 320-322
 - operating ratio of, 322-323
 - operating revenues of, 317-318
 - overcapitalization of, 328-329
 - overissue of bonds of, 329-331
 - and Panama Canal, 274
 - and panic of 1893, 331
 - and pipe lines, 275
 - present capitalization of, 333-335
 - present status of, 272-273
 - and progress, 272
 - property of, as security, 323-324
 - and rate of return allowed, 305-306
 - recent financing of, 333
 - stock dividends of, 331
 - taxes of, 323
 - waterways and, 274-275
- Railway Labor Act of 1926, 302
- Rating of securities, 242-255
 - bases for, 242-244
 - Fitch system of, 252-253
 - Rating of securities, Fitch, symbols of, 252-253
 - importance of future in, 255
 - Moody's system of, 244-250
 - estimate of, 240-250
 - stocks in, 248-249
 - symbols of, 248
 - Poor's system of, 250-252
 - symbols of, 250-251
 - for safety, 253-255
- Ratio chart, 748
- Real estate, expenses in, 578-579
 - rentals of, 578-579
 - residence property, 579-580
 - site values of, 571-572
 - transfer of, under mortgage, 582-583
 - unoccupied property, 580
 - valuation of, 572-574
 - valuation systems, 574-576
- Real-estate mortgages, ancient, 571
 - default and foreclosure of, 583-584
 - guaranteed, 585
 - legal aspects of, 580-582
 - recent experience of, 586
 - second, 584
 - transfers of, 582
 - in the United States, 571
- Real-estate securities, 571-587
 - income as an element of credit in, 577-578
 - land-trust certificates, 585-586
 - market for, 586-587
 - mortgage bonds, 585
 - collateral, 585
 - stocks and bonds, 586
- Real-estate values, fluctuation of, 576-577
 - growth of, 576-577
- Receivers' certificates, 196-197
- Refunding Act of 1870, 613
- Registered bonds, 188
- Regulation, in America, early, 280
 - common-law basis of, 278-279
 - early examples of, 277
 - and laissez faire, 279-280
 - mediaeval, 278
 - under mercantilism, 279
 - power of, 277
 - (See also Public-utility regulation, Railroad regulation)
- Reorganization, and contractual features, 191-192
 - stocks in, 220
- Reserve, economic, 5-6

- Residence property, 579-580
 - Retirement reserve, 365-366
 - Return to invested capital, 77-91
 - changes in price level and, 89-90
 - competition and, 88
 - dynamic industry and, 90
 - good management and, 86
 - gross, 93
 - immobility of capital and, 87
 - inventions and discoveries and, 85-86
 - lack of uniformity in, 86-87
 - liquid capital and, 87-88
 - low level of, 84-85
 - marketability and, 93-94
 - monopoly and, 89
 - net, 93
 - risk and, 90-91
 - Revenue systems, of states, 640-641
 - of the United States Government, 623-625
 - Rights, 210-211
 - valuation of, 211
 - Risk, apportionment of, 184-185
 - business, 128-129
 - financial, 129-130
 - market, 130-131
 - and profits, 90-91
 - and return to capital, 90-91
 - and risk-bearers, 14-15
 - (*See also* Investment risk)
 - Risk factor and value, 109-110
 - River-bank protection bonds, 669
- S**
- Safety, and "blue-sky" legislation, 122
 - indefiniteness of term, 121-123
 - of principal and income, 126-128
 - Saving, and interest, 58-59
 - motives in, 55-58
 - profits and, 59
 - Savings, amount of, 46-49
 - business, 49
 - loss of, 9
 - political stability and, 52
 - Savings banks, and investment funds, 51-52
 - investments of, 51
 - Seasonal variations in business, 705-706
 - Second mortgages, 584
 - Secular trends, in bond prices, 723-724
 - in business, 704-705
 - in railroad traffic, 319
 - Secular trends, in stock prices, 742-743
 - fundamental factors in, 743-744
 - Security issues, 1920-1929, 31
 - Security price movements, and bank credit, 693-694
 - causes of, 689-702
 - and changes in supply of securities, 690-692
 - and demand for securities, 692-693
 - law of supply and demand in, 689-690
 - Security prices and bank credit, 693-694
 - Serial issues, 199-200
 - of municipal bonds, 665-666
 - of state bonds, 645-646
 - Service-at-cost franchises, 355-356
 - Short selling and stock prices, 754-756
 - Sinking funds, contractual features of, 197-199
 - on foreign investments, 683
 - and income, 148-149
 - on municipal bonds, 664-665
 - on state bonds, 645
 - on United States Government bonds, 615-616
 - Site values of real estate, 571-572
 - Sliding-scale franchises, 354-355
 - South Dakota, debt of, 638
 - Sovereignty of states, 643-644
 - Special assessment bonds, 663-664
 - Specialization of management, 223
 - Specialized assets, 164
 - Speculation, and business cycles, 713
 - Chamberlain, L., on, 13n, 17n
 - distinguished from gambling, 15-17
 - distinguished from investment, 12-14
 - Emery, H. C., on, 12, 17n
 - in farm lands, 596
 - Hadley, A. T., on, 12
 - Lavinton, F., on, 12
 - Lyon, H., on, 13
 - Pratt, S. S., on, 12n, 16
 - Price, T., on, 16
 - and stock prices, 752-754
 - State bonds (*see* American state bonds)
 - State debts, by divisions of the United States, 638
 - first period of default in, 632-633
 - floating, 646
 - for improvements, 630-632
 - period of Civil War and after, 634-638
 - period 1843-1860, 634-638
 - period 1914-1932, 638-639
 - restrictions on, 644-645

- State debts, revolutionary period of, 629-630
 second period of default, 634
 sinking funds on, 645
 Statistical value, 703
 Statistics and business cycles, 710
 Steamboat, 263-264
 Stock, increase in, 210
 no-par, 209-210
 preferred, versus common, 211-212
 reduction in, 210
 watered, 208-209
 Stock exchange, evolution of, in England, 35-37
 Stock prices, 734-756
 averages of, 748
 and bond prices, 745-746
 and current earnings, 737-738
 cycles of, 740
 discounting process in, 738
 dividends versus earnings in, 736-737
 Dow's theory of movements of, 746-748
 earnings versus dividends in, 736-737
 forecasting, 744-745
 great cycles in, 741-742
 and income, 735-736
 of individual stocks, 748-749
 and interest rate, 736
 international, 749, 750
 major cycles in, 740-741
 phases of, 741
 market factors in, 738-739
 minor cycles in, 749, 751-752
 price-earnings ratio in, 739-740
 short selling and, 754-756
 speculation and, 752-754
 trends in, 742-743
 fundamental factors in, 743-744
 Stockholders, liabilities of, to creditors, 206-207
 number of, in corporations, 51
 participation in management by, 202-203
 personal liability of, 207-208
 position of, 26-27
 powers of, 204-205
 rights of, 205-206
 voting rights of, 202-204
 Stocks, versus bonds, 180-181
 value of, 110-111
 yield on, 111-113
 Street railways, early, 438
 Street railways, franchise of, 447
 Supply and demand and interest rate, 97-101
 Surety and fidelity insurance, 550
- T**
- Tax covenant, in corporation mortgages, 187-188
 Taxation, of state bonds, 647-648
 and value, 110
 Telegraph, 456-473
 and business cycles, 471
 bonds of telegraph companies, 472
 capitalization of, 471-472
 commercial development of, 459-463
 pre-war stagnation in, 461-462
 during World War and after, 462-463
 early experiments with electric, 456-458
 improvements in, 463
 International Telephone and, 468-469
 of Morse, 458-459
 net income of, 471
 operating expenses of, 470-471
 operating ratio of, 471
 operating revenues of, 470
 cyclical fluctuations in, 471
 seasonal variations in, 471
 other improvements, 464-465
 pithball, 457
 repeaters in, 464
 simplex system of, 464
 stocks of companies, 472-473
 technical advances in, 463-464
 Western Union, 460-468, 470-473
 wireless, 469-470
 Telephone, 474-494
 accounts of, 486-487
 early experiments with, 474-475
 exchange, 475-478
 invention of, by Bell, 475-478
 long-distance service of, 484
 a natural monopoly, 483
 outlook for, 485
 radio service of, 484-485
 recent progress of, 481-482
 regulation of, 485-486
 by commissions, 486
 technical progress in, 483-484
 world position of the United States, 487-488

Tennessee, debt of, 636
 Texas, debt of, 634
 Time element and investment risk, 124-126
 Trading companies, 504
 Trading on the equity, 75-76
 Transport, ancient, 259-260
 in England, 260
 in France, 260
 modern, 260
 old world, 259-260
 primitive, 259
 Transportation in America, early, 260-262
 Transportation Act of 1920, 297-302
 consolidation under, 300
 rate provisions of, 298-299
 and rates, 298
 Trustee, of corporation mortgage, 186-187
 Turnpike, 260

U

Underwriting profit and loss, 552-553
 United States, a creditor nation, 672-675
 income of, nature of, 622-623
 wealth of, nature of, 621-622
 United States Government, debt of, in
 1790, 610
 during Civil War and after, 612-614
 distribution of, in 1803, 611
 retirement of, 614-616
 World-War period of, 614
 early debt record of, 609-611
 expenditures of, 625-626
 foreign indebtedness to, 615
 revenue system of, 623-625
 second period of debts, 611-612
 United States Government bonds, 609-628
 contractual features of, 619
 market, price, and yield of, 626-628
 outstanding issues of, 616-618
 payable in gold, 619-620
 price movements in, 725-726
 retirement of, 614-616
 Unpredictable risks, 131-133

V

Validation of municipal bonds, 662-663
 Valuation, and accrued depreciation, 362-363

Valuation, competitive cost the true principle in, 360-361
 legal doctrine of, in public utilities, 357-358
 of real estate, 572-574
 and sales prices, 575-576
 systems of, 574-575
 standards of, in public utilities, 358-360
 Valuation Act of 1913, 294-296
 Value, common measure of, 111
 present, of future income, 108-109
 versus price, 703, 735
 price, and yield, 108-117
 and risk factor, 109-110
 statistical, 703
 of stocks, 110-111
 taxation and, 110
 Virginia, debt of, 635
 Voting trust, 204

W

Wages and business cycles, 715
 Wages and capital, 74
 Warrants, 210
 municipal, 663
 Waste in industry, 54-55
 Wasting assets, 167-168
 Water power, development of, 381-382, 384
 future of, 384
 Water supply, 426-427
 and drouth of 1930, 428
 location of, 427-429
 procuring of, 428
 public, main uses of, 430
 Water works, 423-437
 American Water Works Association, 431, 433-435
 in ancient times, 423-424
 assets of, 434-435
 bonds of, 436
 capitalization of, 435-436
 common stocks of, 437
 corporate organization of, 435
 depreciation in, 432-433
 early history of, 423-424
 in Europe, 424-425
 Federal Water Service, 431, 433-437
 holding company securities of, 436-437
 in middle ages, 424
 modern, in Europe, 424-425
 municipal bonds for, 429-430

- Water works, municipal ownership of, 429
 net revenues of, 433-434
 operating expenses of, 431-432
 operating ratio of, 433
 operating revenues of, 431, 433-434
 ownership of, 429
 preferred stocks of, 437
 taxation of, 430-431
 technical improvements in, 426
 in the United States, 425-426
Watered stock, 208-209
- Waterways and railways, 274-275
Wealth, details of, in the United States, 64
 intangible amount of, 21
 details of, 64-65
 of states, 639-640
 total, in the United States, 46
West Virginia, debt of, 635
Western Electric Company, 478-479
Western Union Telegraph Company, 460-468
Wireless telegraph, 469-473